BOROUGH OF DARTFORD

CERTAIN MATTERS CONCERNING PUBLIC HEALTH 1966-1969.

(Part. 3.)

Sanitary Circumstances.

BOROUGH OF DARTFORD

Report for the years 1966-69 on certain matters concerning Public Health

PART 3

The duties to which this report contributes were outlined in the introduction in Part 1. The report is being produced in four parts:

1 VITAL STATISTICS
2 STATISTICS OF COMMUNICABLE DISEASE
3 SANITARY CIRCUMSTANCES
4 COMMENTARY AND SUMMARY

I am submitting each part to the Council as it is completed. Parts 1 and 2 have already been submitted. Part 3 I submit herewith.

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MEDICAL OFFICER OF HEALTH

February, 1972

I N D E X

HOUSING:

TABLE		PAGE
XLIV	Conjecture of housing need of 1961 population	113,114
XLV	Shared dwellings 1961 census	114
XLVI	Council dwellings built 1953-1969	114
XLVII	Dartford Borough: Past and future housing	115
XLVIII*	Housing provision in the 17 years 1953-1969	116
XLIX *	Improvement grants. Rates per thousand homes without fixed bath in 1961 census. Dartford M.B., Dartford R.D., Northfleet U.D., and Swanscombe U.D.	117
*	Histogram interpretating above	118
L	Housing. Dartford M.B., 1966-1969. Houses built, rehousing-medical priority, houses made fit, improved, demolished etc.	119,120, 121,122

WATER:

TABLE		PAGE
LI	Quality. Bacteriological sampling results. Hospitals.Factories	122,123,124
LII	Quality. Bacteriological sampling results. Swimming pools.	125
LIII	Bacteriological analyses 1966-1967 Sampling by Metropolitan Water Board of well waters	126
LIV	Bacteriological analyses 1968-1969 Sampling by Metropolitan Water Board of well waters	127
LV	Chemical analyses 1966-1967 Sampling by Metropolitan Water Board of well waters	128
LVI	Chemical analyses 1968-1969 Sampling by Metropolitan Water Board of well waters	129
LVII *	Nitrate nitrogen in well waters. Dartford and district	124, 130,131,132
LVIII *	Nitrate nitrogen. Well waters of water authorities	133

DRAINAGE:

TABLE		PAGE
LVIII	Drainage work-Dartford M.B.	134
	-West Kent Main Sewerage Works effluent	134
LIX *	Sewage effluents and River Thames	135

continued..

I N D E X (continued)

FOOD:

TABLE		PAGE
LX	Hygiene. Registered premises. Food preparation	136,137
LXI	Unfit food. Legal proceedings	138,139
LXII	Food content. Legal proceedings.	140

PLACES OF WORK:

TABLE		PAGE
LXIII	Offices, Shops and Railway Premises: registrations, inspections, persons employed, defects remedied.	141,142
LXIV	Accidents. Legal proceedings. Duties of other authorities. Shops Act.	143,144
LXV	Factories - Inspections. Defects remedied. Outworkers.	145,146
LXVI	VERMIN	147
LXVII	HYGIENE FACILITIES PROVIDED BY THE COUNCIL	147

RADIOACTIVITY:

TABLE		PAGE
LXVIII	Registrations for use of radioactive substances	148,149
LXIX	Authorisations for the disposal of radioactive waste	150,151
LXX	Radioactive waste from major nuclear power stations	152
LXXI	Atomic or Hydrogen Bomb Tests	149
	Strontium 90 deposited by rain and in milk. Graphs interpreting trend.	153,154
LXXII	NOISE	155

AIR POLLUTION WITH PRODUCTS OF COMBUSTION:

TABLE		PAGE
LXXIII	Smoke Control Areas	155
LXXIV	Details of local volumetric gauges	156
LXXV	Interpretation of Smoke/SO_2 ratios	157
LXXVI	Months of minimum pollution measurements 1963-1970	158
LXXVII	Months of maximum pollution measurements 1963-1970	159
LXXVIII	Days when readings exceeded 500 microgrammes per cu.metre	160
LXXIX	Degree days	160
LXXX	Smoke : Thames-side : Winters 1962-1970	161
LXXXI	Sulphur Dioxide : Thames-side : Winters 1962-1970	
LXXXII	Smoke/SO_2 ratio : Thames-side : Winters 1962-1970	
	Histograms interpreting the above.	164,165,166

AIR POLLUTION WITH DUST OF COMBUSTION AND RAW MATERIAL

Deposit gauge readings 1954-1969:

TABLE		PAGE
LXXXIII	Dartford	167
LXXXIV	Horns Cross - Swanscombe - Northfleet	168
LXXXV	London to Northfleet readings grouped	169
LXXXVI	Gravesend gauges grouped	170
LXXXVII	13 Thames-side gauges grouped	171
	Graphs interpreting above	172,173,174
	Histogram of average yearly deposits - Thames-side	175
LXXXVIII	Statistical method of estimating significance of changes	176
LXXXIX	Significance of changes in readings of total dust	177,178
XC	" " " " " " dust from cement works	178,179
XCI	" " " " " " dust from other sources	179,180,181
XCII	" " " " " " total dust, dust from cement works, and dust from other sources, in summated readings of groups of gauges.	182

DARTFORD BOROUGH

TABLE XLIV CONJECTURE OF HOUSING NEED OF 1961 POPULATION

Immediate need of 1961

Shared accommodation 1961 (census) (Derived from Tables 11 and 13 of Kent Report and correspondence with the Registrar General).		Families needing rehousing
Households* sharing dwelling with one other household	254	127
" " " " two " households	33	22
" containing two or more families 330 i.e. say:		
" " two families	297	297
" " three "	33	66
Dwellings and sites required to relieve sharing		512

*A group which benefits from common housekeeping i.e. sharing a meal table.

Replacement of dwellings

Unfit dwellings requiring demolition and replacement i.e. remainder of slum clearance programme (These will not require sites)	88
Total immediate need	600

Annual recurrent need from January 1962 onwards

Natural increase: Dwellings are required on marriage and are vacated at death. The dwellings required by those assuming independence but not marrying are balanced by those who do not marry but live as part of other households and by those who do not survive to marriage age. Thus the number of dwellings required each year is roughly half the annual number of births that occurred twenty years before less half the current annual number of deaths. When the number of such births equals the number of such deaths the population is stable and the number of dwellings required ceases to increase.

Migration: The above conjecture assumes that in regard to all population movement into and out of the Borough immigration will be balanced by emigration.

Pertaining to 1961 population

	Annual births	Annual Town deaths	Annual number of dwellings required with sites in the decade following the stated year
1941	600		
1951	700		
1961	800	400	600/2 - 400/2 = 100
1971	700	450	700/2 - 450/2 = 125
1981	600	500	800/2 - 500/2 = 150
1991	500	500	700/2 - 500/2 = 100
2001		500	600/2 - 500/2 = 50
2011		500	500/2 - 500/2 = 0
	Total births	Total deaths	Total dwellings
1941-1991	3900 x 10		
1961-2011		2850 x 10	(3900/2 - 2850/2) x 10 = 525 x 10

For the 1961 Borough population after 5250 dwellings and sites have been provided in five decades there may be equilibrium in the year 2011.

Replacement of dwellings. After the demolition of unfit houses the remaining maintained houses should last indefinitely apart from catastrophies. However, it would be expedient to assume that ½% of houses will require replacement each year after the 80th year of being built. Sites will not be required for these dwellings. Conjecture on the necessary replacements is given in the following table XLVII.

TABLE XLIV (continued) SUMMARY

Total need of 1961 population

	Immediate	Annual recurrent 1962-71	1972-81	1982-91
Dwellings and sites	512	100	125	150
Dwellings on vacated sites	88	10	15	20
	600	110	140	170

1962-69

Thus dwellings required in the eight years 1962-69 were 600 + 880 = 1480 and as a substantial portion of the resident population hoped to be housed by the Council a similar portion of these 1480 dwellings needed to be Council owned.

Table XLV SHARED DWELLINGS 1961 CENSUS

Derived from Tables 11 and 13 of Kent Report and correspondence with the Registrar General.

	Dartford Town*	Dartford R.R.D.*	Northfleet U.D.	Swanscombe U.D.
(a) Existing dwellings shared:				
(i) dwellings with: two households	127	51	64	19
three "	11	4	9	2
(ii) households with: two families	297	441	171	54
three "	33	49	19	6
∴ Dwellings shared assuming (i) does not include (ii)	468	545	263	81
(b) Total dwellings required where:				
dwellings have: two households	254	102	128	38
three "	33	12	27	6
households have: two families	594	882	342	108
three "	99	147	57	18
	980	1,143	554	170
∴ Additional dwellings required to end sharing and provide one dwelling for each of all families i.e. (b)-(a)	512	598	291	89
Population 1961	43,460	51,260	22,380	8,910
Rate per 10,000 population	118	117	130	100

*Denotes each district population less 2000 in long stay hospitals

TABLE XLVI COUNCIL DWELLINGS BUILT 1953 - 1969

	per 10,000 1953 population	as percentage of all dwellings built
*Dartford Town	514 °/ooo	51%
*Dartford Residential Rural District	703 °/ooo	23%
Northfleet Urban District	847 °/ooo	45%
Swanscombe Urban District	734 °/ooo	60%

TABLE XLVII DARTFORD BOROUGH 1961 POPULATION. PAST AND FUTURE HOUSING

Decade	May be built	Dwellings which on 31st Dec. of each census year																	
2012-21	0																		2021 19762
2002-11	500																	2011 19762	
1992-01	1000														may be needed		2001 19262		
1982-91	1500															1991 18262			
1972-81	1250														1981 16762				
1962-71	1512													1971 15512					
	Built																		
1952-61	3000												1961 14000						
1942-51	1000						were in use					1951 11000					may need to be replaced		
1932-41	4000										1941 10000								200
1922-31	1500									1931 6000								5	75
1912-21	500								1921 4500								25	25	25
1902-11	1000							1911 4000								50	50	50	50
1892-01	1000						1901 3000								50	50	50	50	50
1882-91	300					1891 2000					may have been replaced			15	15	15	15	15	15
1872-81	300				1881 1700								15	15	15	15	15	15	15
1862-71	300			1871 1400								15	15	15	15	15	15	15	15
1852-61	100		1861 1100								5	5	5	5	5	5	5	5	5
1842-51	100	1851 1000								5	5	5	5	5	5	5	5	5	5
Before 1842	900				45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Total replacements required for decade ending 31st Dec.census year					45	45	45	45	45	50	55	70	85	100	150	200	225	300	500

Table XLV III Housing Provision in the 17 years 1953-1969

Local Authority	Population mid 1953	Population mid 1970	17 years Population increase			Dwellings built 1953-69					Dwellings put out of use for habitation					Increase in dwellings available		Increase in population mid 1953-mid 1970 per 100 additional dwellings available		
						Council enterprise														
			Total mid 1953-mid 1970	Natural 1953-1969	Migration	Built	Boundary change 1957	Private enterprise	Boundary change 1957	Total	Unfit and demolished	Purchased by L.A. for re-development	Hutments demolished	Prefabricated bungalows demolished	Total	Number	Per 10,000 1953 population	Natural	Migration	Total
Dartford Town	38430	44260	5830	5478	+352	1611	+486	1909	+1	4007	397	about 20	0	6	423	3584	935	153	+10	163
Dartford Residential Rural District	36610	63000	26390	8880	17510	2933 (367 by Borough)	-486	7524	-1	9970	306	about 30	16	71	423	9547	2610	93	+184	277
Northfleet Urban District	19280	25600	6320	3493	2827	1636	-	2010	-	3646	204	271	3	0	478	3142	1630	111	+90	201
Swanscombe Urban District	8614	9430	816	1067	-251	633	-	417	-	1050	75	8	38	100	221	829	960	129	-30	99
Cols.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Dartford Town = Borough less 2000 persons in institutions
Dartford Residential Rural area = District " " " " "

TABLE ~~XXI~~ XLIX IMPROVEMENT GRANTS

RATES PER THOUSAND HOUSES WITHOUT FIXED BATH AT 1961 CENSUS
cumulative

Year	Standard grants	o/oo Houses no bath	Expend. £000	o/oo Houses no bath	Discret. grants	o/oo Houses no bath	Expend. £000	o/oo Houses no bath
Dartford R.D.								
1961	32	13°/oo	3	1.2°/oo	160	63°/oo	36	14.2°/oo
1962	74	29°/oo	8	3.1 "	227	89 "	41	16.1 "
1963	122	48°/oo	15	5.9 "	227	89 "	41	16.1 "
1964	180	71°/oo	22	8.6 "	229	90 "	41	16.1 "
1965	257	101°/oo	31	12.3 "	242	95 "	43	16.9 "
1966	304	119°/oo	42	16.5 "	243	95 "	44	17.5 "
1967	378	148°/oo	57	22.4 "	243	95 "	44	17.5 "
1968	460	181°/oo	75	29.4 "	243	95 "	44	17.5 "
1969	557	219°/oo	96	37.7 "	245	96 "	45	17.7 "
1970	600	236°/oo	107	42.0 "	246	97 "	45	17.7 "
1971	666	262°/oo	124	47.9 "	278	109 "	63	24.7 "
Dartford M.B.								
1961	25	14°/oo	2	1.1°/oo	82	46°/oo	15	8.4°/oo
1962	43	24 "	4	2.2	100	56 "	19	10.6 "
1963	59	33 "	6	3.4	121	68 "	24	13.4 "
1964	85	48 "	9	5.0	143	80 "	30	16.8 "
1965	106	59 "	11	6.2	164	91 "	38	21.3 "
1966	123	69 "	14	7.8	179	100 "	42	23.5 "
1967	147	82 "	17	9.5	204	115 "	52	28.1 "
1968	173	97 "	20	11.2	214	120 "	61	34.2 "
1969	213	119 "	28	15.7	219	123 "	64	35.9 "
1970	249	140 "	36	20.2	225	126 "	66	37.0 "
1971	300	168 "	44	24.6	232	130 "	68	38.0 "
Northfleet U.D.								
1961	15	10	1	0.1°/oo	94	58°/oo	17	10.5°/oo
1962	27	16	1	0.1 "	119	73 "	21	12.9 "
1963	35	22	2	1.3 "	130	80 "	27	16.6 "
1964	42	26	3	1.9 "	146	90 "	31	19.1 "
1965	57	35	6	3.7 "	179	110 "	40	24.6 "
1066	76	47	8	4.9 "	210	129 "	47	28.9 "
1967	90	55	9	5.5 "	236	145 "	55	33.8 "
1968	103	63	11	6.8 "	269	166 "	66	40.6 "
1969	127	78	14	8.6 "	293	180 "	74	45.5 "
1970	151	93	16	9.9 "	312	194 "	80	49.2 "
1971	183	112	22	13.5 "	338	208 "	94	57.8 "
Swanscombe U.D.								
1961	11	15°/oo	1	1.3°/oo	44	58°/oo	8	10.5°/oo
1962	18	24 "	1	1.3 "	56	74 "	11	14.5 "
1963	25	33 "	2	2.6 "	64	84 "	13	17.1 "
1964	39	51 "	3	3.9 "	79	104 "	17	22.4 "
1965	57	75 "	5	6.6 "	88	116 "	19	25.0 "
1966	65	86 "	6	7.9 "	97	128 "	22	29.0 "
1967	93	123 "	11	14.5 "	102	134 "	23	30.1 "
1968	105	138 "	14	18.4 "	110	145 "	26	34.2 "
1969	119	157 "	23	30.3 "	116	153 "	29	38.2 "
1970	149	197 "	31	40.8 "	122	161 "	29	38.2 "
1971	183	241 "	34	44.7 "	129	170 "	33	43.4 "

HOUSES WITHOUT FIXED BATH 1961

Dartford R.D.	2542	Northfleet U.D.	1626
Dartford M.B.	1783	Swanscombe U.D.	760

IMPROVEMENT GRANTS

NUMBER AND EXPENDITURE PER THOUSAND HOUSES WITHOUT FIXED BATH AT 1961 CENSUS (CUMULATIVE)

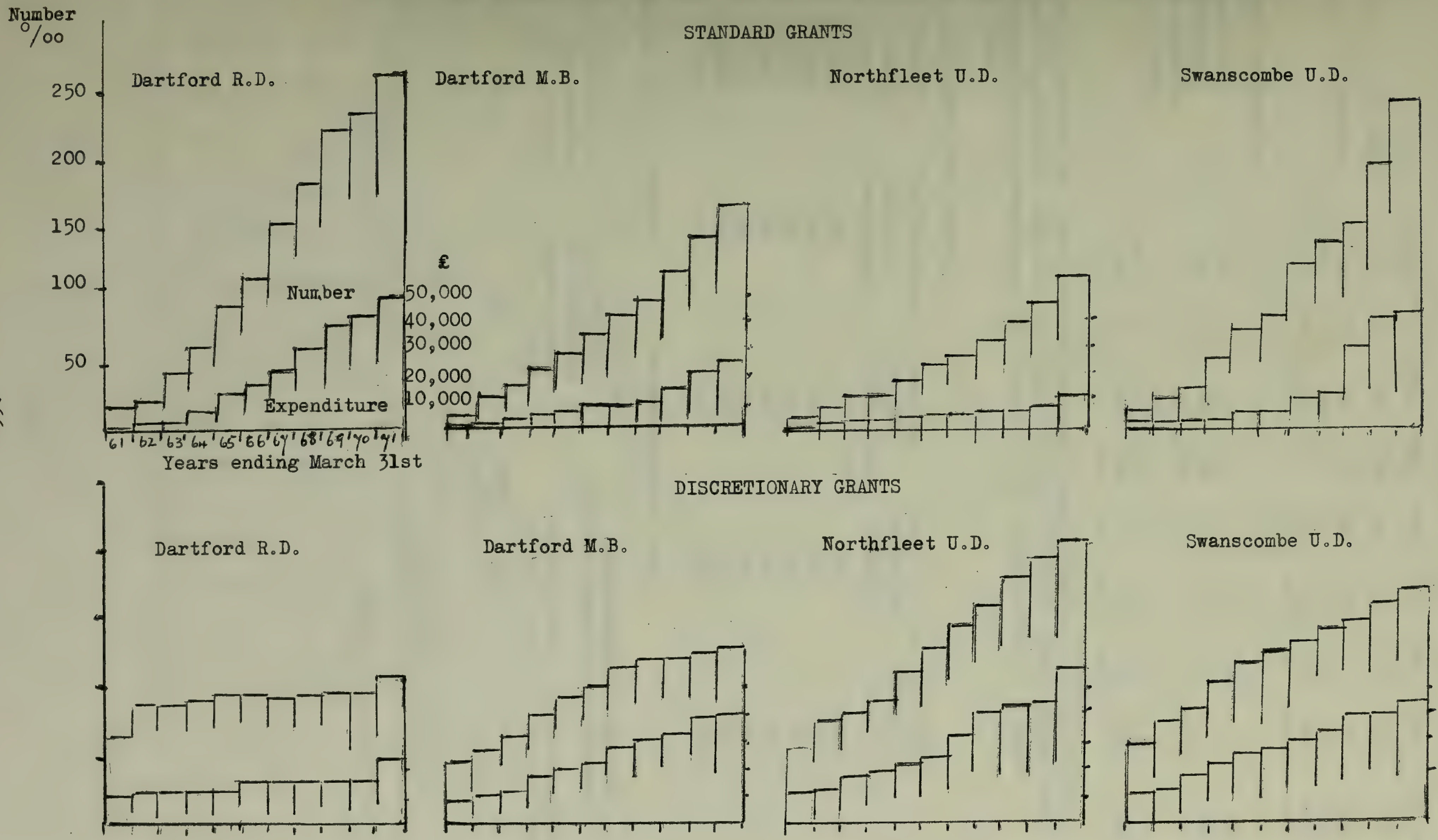


TABLE L HOUSING (continued) Dartford M.B.

NEW HOUSES: The following dwellings have been completed in recent years:

	1962	1963	1964	1965	1966	1967	1968	1969	1962-69
By Council enterprise	33	52	150	138	nil	12	17	146	548
" private enterprise	144	78	108	33	20	33	11	53	480
	177	130	258	171	20	45	28	199	1028
By Council enterprise -									
One bedroom	29	12	-	32	-	6	-	-	79
Two bedrooms	4	4	68	26	-	6	-	-	108
Three bedrooms	-	36	82	80	-	-	17	146	361
Four bedrooms	-	-	-	-	-	-	-	-	-
	33	52	150	138	-	12	17	146	548

By voluntary enterprise. The Dartford Churches Housing Association converted one house into two flats in 1967 and one house into four flats in 1968. These were made available by the Association for high priority applicants on the Council's waiting list.

HOUSING PROVIDED BY THE COUNCIL

Year ending Dec.	Applications received during year	Families rehoused during year	Applications cancelled during year	Effective list at end of year
1964	338	231	216	1040
1965	392	158	300	974
1966	353	141	215	971
1967	306	100	246	931
1968	286	125	197	895
1969	386	205	183	893
1970	265	84	238	836

Priority on medical grounds: Recommendations were -

Tuberculosis

	(a) Applications for transfer Points given 0 1-5 6-10	(b) Applications for rehousing Points given 0 1-5 6-10
1966-69	nil	nil

	Transferred or rehoused (a) Transferred Points given 0 1-5 6-10	(b) Rehoused Points given 0	1-5	6-10
1966	nil	-	1	-
1967-69	nil	-	nil	-

Other than tuberculosis

	(a) Applications for transfer			(b) Applications for rehousing			Total	Transferred or rehoused (a) Transferred			(b) Rehoused			Total
	Number of points given							Number of points given						
	0	1-5	6-10	0	1-5	6-10		0	1-5	6-10	0	1-5	6-10	
1966	7	27	nil	5	33	nil	72	2	18	nil	1	16	nil	37
1967	14	23	1	8	26	1	73	3	15	1	3	8	"	30
1968	6	20	1	5	19	nil	51	3	12	1	3	10	"	29
1969	14	24	nil	nil	29	"	67	2	23	nil	3	14	"	42

TABLE L (continued) HOUSING (continued) Dartford M.B.

IMPROVEMENT GRANTS APPLIED FOR

	1966	1967	1968	1969
Number of applications for Discretionary Grants approved during year	28	5	12	5
Number of applications for Standard Grants approved during year	24	26	51	31
Grant payments made for works completed during year in respect of discretionary grants	£5,528 18 premises	£7,356 16 premises	£990 12 premises	£3,095 9 premises
Grant payments made for works completed during year in respect of standard grants	£2,917 20 premises	£3,192 24 premises	£6,531 33 premises	£8,733 46 premises

UNFIT HOUSES MADE FIT

	By owner				By local authority			
	1966	1967	1968	1969	1966	1967	1968	1969
After informal action by local authority	71	41	58	73	nil	nil	nil	nil
After formal notice under (a) Public Health Acts	9	29	19	11	"	"	"	"
(b) S.24 Housing Act 1957	nil	nil	nil	nil	"	"	"	"

REPAIRS:

The following are details of repairs initiated by the Council's Public Health Inspectors:

		1966	1967	1968	1969
Accumulation of refuse or manure removed		9	7	3	12
Animals - nuisance abated		-	2	-	-
Brickwork	(a) repaired	2	5	3	11
	(b) repointed or rendered	4	6	17	18
Ceilings	(a) Cleansed	-	-	-	-
	(b) repaired	14	16	5	3
Cesspools	(a) emptied	2	-	-	-
	(b) repaired	-	-	-	-
Cooking apparatus repaired or renewed		-	-	-	-
Coppers repaired or renewed		-	-	-	-
Doors - frames or fittings repaired or renewed		11	13	14	5
Fireplaces	(a) grates provided	-	3	-	2
	(b) other repairs	1	-	3	1
Floors	(a) floorboards repaired	3	8	8	6
	(b) floor joists repaired	-	3	2	3
	(c) sub-floor ventilation improved	-	-	4	-
	(d) solid floors repaired	-	-	1	2
Roofs	(a) repaired	28	28	31	35
	(b) stripped	2	-	-	-
	(c) eavesgutters repaired	12	11	17	23
	(d) downpipes repaired	2	6	9	6
Sinks	(a) sinks renewed	-	-	-	-
	(b) sink waste pipes renewed	2	2	-	3
Stairs	(a) new treads or risers	-	4	3	2
	(b) handrails provided	-	-	2	-
Walls	(a) cleansed and redecorated	-	-	-	-
	(b) plaster repaired	10	23	37	7
	(c) dampness abated	60	68	112	106

(continued..

REPAIRS (continued)

			1966	1967	1968	1969
Water supply	(a)	taps, pipes etc. repaired	8	2	7	3
	(b)	water storage tanks repaired or renewed	1	3	3	-
Windows	(a)	inadequate light and ventilation	-	-	-	-
	(b)	frames, sashes or casements repaired	8	29	26	15
	(c)	glazing or putties	-	2	4	-
	(d)	sashcords etc. repaired	3	14	15	7
W.C's	(a)	flushing cisterns repaired or renewed	23	18	6	8
	(b)	W.C. pans removed	2	2	11	1
	(c)	W.C. seats repaired or renewed	1	4	1	3
Yard paving	(a)	repaired	-	-	-	-
	(b)	redrained	1	-	-	-
Miscellaneous defects not included above			9	11	5	6

RENT ACT 1957

	1966	1967	1968	1969
The following applications for certificates of disrepair have been received	2	1	1	nil
Certificates issued	1	-	1	nil

HOUSES DEMOLISHED - HOUSING ACT, 1957

		1966	1967	1968	1969
In Clearance Areas	Houses unfit	nil	5	19	31
Not in Clearance Areas	" "	11	9	nil	nil

UNFIT HOUSES CLOSED:

	1966	1967	1968	1969
Under sections 16 and 17 etc Housing Act 1957	2	nil	1	18
Parts of buildings closed under section 18	1	11	1	1

PREMISES DEMOLISHED

1966	1967	1968
Nos.19-39 Overy Street	Nos.31,33,35 and 37 East Hill No. 38 Heath Street Nos.2-10 (inclusive) St. James's Place	Nos.14-20 Little Queen Street Nos.198-226 Dartford Road

1969

Nos.1-15 West View Road, Nos.153-175 Lowfield Street, Nos.39-45 East Hill

PREMISES CLOSED

1966	1967	1968
No.11 Overy Street No. 6 St. James's Place No. 9 West Hill(part)	Part of buildings Nos.57-69 West Hill and 52c 52d 52e 52f West Hill	No. 24 Little Queen Street Part of No.78 West View Road

1969

Nos. 6, 32, 82 and 84 Highfield Road, Part of No.41 Spring Vale, Nos. 185, 189 and 209 Lowfield Street, Nos. 3 and 4 Rose Villas, Nos. 1 and 2 Heathkeepers Cottages, Nos. 24, 25, 27, 28 and 31 Home Gardens. No.146 Lower Hythe Street.

ORDERS CONFIRMED

	Houses affected			
	1966	1967	1968	1969
Clearance	8	36	-	-
Demolition	-	-	-	2
Closure whole dwellings	2	1	-	2
parts of dwellings	-	11	1	1
Undertakings not to be used for habitation	-	-	-	-

TABLE L (continued) HOUSING (continued) Dartford M.B.

PERSONS DISPLACED

	1966		1967		1968		1969	
	Persons	Families	Persons	Families	Persons	Families	Persons	Families
In Clearance Areas:								
Houses unfit	24	11	67	27	25	8	110	28
Not in Clearance Areas:								
Houses unfit	10	2	-	-	-	-	2	1

STATUTORY OVERCROWDING:

Three complaints were received in 1966, one in 1968 and one in 1969. Of these only one premises was found to be statutorily overcrowded and this was abated by informal action.

MULTIPLE OCCUPATION:

1969. Twenty houses were known to be in multiple occupation at the end of the year. Statutory notices under Sections 15 and 19 of the Housing Act 1961 were served in respect of one premises and complied with.

MOVEABLE DWELLINGS:

	1966	1967	1968	1969
Site licences in force at 31st December	2	3	2	2
Number of caravans permitted	10 1	10 1 1	10 1	10 1

TABLE LI WATER

GATHERING GROUND. The chalk below this district is part of the gathering ground for this part of Kent. All the permanent dwellings of Dartford Borough have the Metropolitan Water Board's water piped into them. Two hospitals and three factories have their own well supplies.

QUANTITY. The quantity of water for human consumption at present is abundant.

SWIMMING POOLS. There are three:

Burnham Road. A pool for use by the public and owned by the Council. Open air. Water filtered, chlorinated and heated. Residual chlorine content of water at inlet 0.5 p.p.m.

Dartford College of Physical Education. An indoor pool. Water filtered, chlorinated and heated.

Oakfield Lane County Primary School. A covered pool. Water filtered and chlorinated.

QUALITY. The results of analyses are given in the following pages. The M.W.B. have provided the results of their sampling. The samples of water of the hospitals, factories and swimming pools were taken by the Council's Public Health Inspectors and analysed by the County Analyst and Public Health Laboratory.

TABLE LI (continued)

WATER QUALITY

Sampling results

HOSPITALS

West Hill Hospital

Samples sent	No. of samples	Coliforms per 100 ml.
1966		
about monthly	8	0
Feb.	1	1 (1)*
1967		
about monthly	12	0
June	1	2 (0)*
1968		
monthly	24	0
Oct.	2	2 (2)*
"	1	(18+)(18+)*
Nov.	2	(18+)(18+)*
1969		
about monthly	20	0

Bexley Hospital

Samples sent	No. of samples	Coliforms per 100 ml.
1966		
Feb. May Aug. Nov.	4	0
1967		
Feb. June Sept.	3	0
1968		
Feb. May	2	0
1969		
Feb. Apr. June Nov. Dec.	8	0

FACTORIES

J & E. Hall's Hythe Street Works

Samples sent	No. of samples	Coliforms per 100 ml.
1966		
Feb. May Aug. Nov.	4	0
1967		
Feb. May Sept. Nov.	4	0
1968		
Feb. May Sept. Oct.	8	0
Sept.	1	18+ (18+)*
"	1	18+ (1)*
"	1	2 (0)*
"	1	1 (1)*
Oct.	1	6 (0)*
"	1	2 (0)*
"	1	2 (2)*
1969		
Feb. June Sept. Nov. Dec.	6	0

J & E. Hall's Victoria Road Works

Samples sent	No. of samples	Coliforms per 100 ml.
1966		
Feb. May Aug. Nov.	4	0
1967		
Feb. May Nov.	3	0
Sept.	1	1 (0)*
1968		
Feb. July Aug. Sept. Oct.	6	0
Sept.	1	18+ (5)*
"	1	3 (0)*
1969		
Feb. June Nov. Dec.	5	0

* The figures in brackets represent E coli type I included in coliforms

TABLE LI (continued) WATER (continued)

QUALITY - Sampling results

FACTORIES (continued)

Greaseproof Paper Mills(Wiggins Teape)

Samples sent	No.of samples	Coliforms per 100 ml.
1966		
Feb.) May) Aug.) Sept.) Nov.)	5	0
August	1	8 (2)*
1967		
Feb.) May) Sept.) Nov.)	4	0

Greaseproof Paper Mills (continued)

Samples sent	No. of samples	Coliforms per 100 ml.
1968		
Feb-) Dec.)	15	0
Sept.	2	18+(18+)
"	1	16 (3)*
Oct.	1	18+(4)*
"	1	16 (6)*
"	2	16 (3)*
"	1	9 (1)*
"	1	2 (2)*
"	1	6+(6+)*
Nov.	2	2 (0)*
Dec.	3	2 (0)*
1969		
about monthly	15	0
April	1	2 (2)*

London Paper Mills

1966 (on M.W.B. for drinking water after February)

Feb.	1	0
"	1	3 (0)*

Burroughs Wellcome & Co.

1969	No. 3 Bore	
July	1	0

*The figures in brackets represent E coli type I included in coliforms.

TABLE LVII West Hill Hospital - Maternity Ward

NITRATES. With the feeding of newborn and premature babies in mind the water at West Hill Hospital was sampled periodically for estimation of nitrates.

Samples sent		Nitrate nitrogen p.p.m.	
1953			
April		10	(Well)
July) ")	2	10	"
1954			
Feb.	2	6	"
1955-1957 no samples taken			
1958			
July		4	(Well) ?
1959			
M.W.B. water in use			
1960 Well in temporary use			
July		8	(Well)
1961			
August		8	"
1962 January		13	"
March		14	"
April		12	"
May		12	"
June		7	"
July		14	"
August		10	"
Sept.		12	"
Oct.		12	"
Nov.		12	"
Dec.		10	"

Samples sent	Nitrate nitrogen p.p.m.	
1963		
Jan.	14	(Well)
Feb.	8	"
March	7	"
April	13	"
May	12	"
June	12	"
July	14	"
August	12	"
Oct.	10	"
Nov.	10	"
Dec.	8	"
1964		
April	10	"
May	11	"
June	12	"
July	12	"
Aug.	12	"
Sept.	10	"
Nov.	12	"
Dec.	12	"
1965		
Jan.	10	"
April	10	"
May	8	"
Aug.	8	"
Nov.	8	"

Samples sent	Nitrate nitrogen p.p.m.	
1966		
Jan.	4)	M.W.B.
Feb.	5)	
"	4)	
April	8	(Well)
June	6	"
Dec.	5	M.W.B.
1967		
Jan.	7	(Well)
March	8	"
April	6	"
Aug.	8	"
Dec.	6	Well and M.W.B.
1968		
Jan.	7	(Well)
Feb.	8	"
July	7	"
August	7	"
1969		
March	5	M.W.B.
June	5	"
July	5	"
August	5	"

TABLE LII WATER (continued)

SWIMMING POOLS - Sampling results

	Date Sample sent	No. of samples	Plate count	Coliforms per 100 ml.		Date Sample sent	No. of samples	Plate count per ml.	Coliforms per 100 ml.
				Burnham Road Open-air Swimming Pool					
1966								1967	
Shallow		4	0	0	Shallow		6	0	0
Deep		4	0	0	Deep		6	0	0
Shallow	(Apr.)	1	1	0	Shallow	(June)	1	1	0
Deep	(")	1	0	0	Deep	(")	1	0	0
Shallow	(May)	1	0	0	Shallow	(")	1	3	0
Deep	(")	1	150	0	Deep	(")	1	2	0
Shallow	(Jun)	1	9	0	Shallow	(July)	1	47	2+ (1)*
Deep	(")	1	16	0	Deep	(")	1	1266	2+ (0)*
Shallow	(Aug)	1	0	0	Shallow	(")	1	20	0
Deep	(")	1	4	0	Deep	(")	1	2	0
					Shallow	(")	1	5	0
					Deep	(")	1	10	0
1968								1969	
Shallow		5	0	0	Shallow		5	0	0
Deep		5	0	0	Deep		5	0	0
Shallow	(Aug)	1	2	0	Shallow	(Aug)	1	2	0
Deep	(")	1	0	0	Deep	(")	1	0	0
				Dartford College of Physical Education					
1966								1967	
Shallow		6	0	0	Shallow		7	0	0
Deep		6	0	0	Deep		7	0	0
Shallow	(May)	1	1	0	Shallow	(June)	1	0	0
Deep	(")	1	0	0	Deep	(")	1	36	0
Shallow	(June)	1	1	0	Shallow	(July)	1	55	0
Deep	(")	1	5	0	Deep	(")	1	21	0
Shallow	(July)	1	1	0					
Deep	(")	1	2	1+ (1+)*					
Shallow	(")	1	200	1+ (0)*					
Deep	(")	1	240	2+ (1+)*					
Shallow	(Aug)	1	0	1 (0)*					
Deep	(")	1	0	0					
Shallow	(")	1	uncountable	0					
Deep	(")	1		0					
Shallow	(Dec.)	1	2	0					
Deep	(")	1	2	0					
1968								1969	
Shallow		5	0	0	Shallow		4	0	0
Deep		5	0	0	Deep		4	0	0
Shallow	(Jan.)	1	2	0	Shallow	(Feb.)	1	0	0
Deep	(")	1	0	0	Deep	(")	1	2	0
Shallow	(Feb.)	1	0	0	Shallow	(April)	1	0	0
Deep	(")	1	1	0	Deep	("	1	2	0
Shallow	(Oct)	1	2	0					
Deep	(")	1	3	0					
				Oakfield Lane County Primary School					
1966								1967	
Inlet	(June)	1	2	0	Inlet	(June)	1	98	0
Outlet	(")	1	8	0	Outlet	(")	1	0	0
Inlet	(July)	1	200	1+ (0)*	Inlet	(July)	1	2157	1 (1)*
Outlet	(")	1	240	2+ (1+)*	Outlet	(")	1	uncountable	2+(2+)*
Inlet	(Sept)	1	0	0	Inlet ø	(")	1	2	2
Outlet	(")	1	0	0	Outlet	(")	1	2270	0
					(øfrom inlet pipe not from water in bath)				
1968								1969	
Inlet		6	0	0	Inlet	(May)	1		0
Outlet		6	0	0	Outlet	(")	1		0
					Inlet	(June)	1		2 (0)*
					Outlet	(")	1		

*The figures in brackets represent E coli type I included in coliforms.

TABLE LIII WATER (continued)

BACTERIOLOGICAL ANALYSES 1966-1967

Sampling by Metropolitan Water Board

TREATED WATER	No. of samples	E coli in 100 ml.
1966	1170	none
1967	1960	none

RAW WATER

Yearly averages

Well	No. of samples	Plate count per ml.		Coliform count per 100 ml.		Escherichia coli count	
		20-24 hrs. 37°C	3 days 22°C	% negative	Av. Count	% negative	Av. Count
1966							
Darenth	248	0.3	67	97.2	0.1	98.8	-
Dartford	248	0.0	2	100.0	-	100.0	-
Eynsford No. 1	204	0.2	14	88.8	0.7	100.0	-
Eynsford No. 2	87	0.0	7	98.9	0.1	100.0	-
Green St.Green No,1	201	0.0	1	92.6	0.2	98.0	-
Green St.Green No. 2	38	0.1	26	97.4	-	97.4	-
Horton Kirby No. 1	233	0.3	64	94.9	0.2	96.2	0.1
Horton Kirby No. 2	246	0.1	2	98.0	0.2	99.6	0.1
Lullingstone No. 1	136	0.0	1	100.0	-	100.0	-
Lullingstone No. 2	122	0.0	0	100.0	-	100.0	-
Southfleet	237	0.8	3	97.5	0.1	100.0	-
Wilmington.	248	1.4	29	96.8	0.1	98.8	-
	2248						
1967							
Darenth	247	0.0	7	99.2	-	99.7	-
Dartford	247	0.1	2	100.0	-	100.0	-
Eynsford No. 1	132	0.3	9	100.0	-	100.0	-
Eynsford No. 2	188	0.0	5	100.0	-	100.0	-
Green St.Green No. 1	177	0.0	5	93.8	0.1	96.7	-
GreenSt.GreenNo. 2	48	0.1	0	91.7	0.2	95.8	0.1
Horton Kirby No. 1	180	0.8	25	91.7	0.8	93.3	0.5
Horton Kirby No. 2	215	0.1	5	93.5	0.4	94.5	0.3
Lullingstone No. 1	146	0.0	1	100.0	-	100.0	-
Lullingstone No. 2	153	0.0	13	100.0	-	100.0	-
Southfleet	221	0.0	102	100.0	-	100.0	-
Wilmington.	250	1.5	4	98.8	-	100.0	-
	2204						

TABLE LIV WATER (continued)

BACTERIOLOGICAL ANALYSES 1968-1969

Sampling by Metropolitan Water Board

TREATED WATER	No. of samples	E coli in 100 ml.
1968	1970	none
1969	1987	none

RAW WATER Yearly averages

Well	No. of samples	Plate count per ml.		Coliform count per 100 ml.		Escherichia coli count	
		20-24 hrs.37° C	3 days 22° C	% negative	Av. Count	% negative	Av. Count
1968							
Darenth	246	0.1	18	97.2	0.1	98.0	0.1
Dartford	221	0.1	21	100.0	-	100.0	-
Eynsford No. 1	179	0.0	32	98.9	-	99.4	-
Eynsford No. 2	158	0.0	6	98.8	-	100.0	-
Green St.Green No.1	199	0.1	5	93.5	0.6	94.5	0.6
Green St.Green No.2	48	0.0	1	89.6	0.5	93.8	0.5
Horton Kirby No. 1	189	0.2	231	84.7	1.0	87.8	1.0
Horton Kirby No. 2	216	0.4	32	89.4	1.1	92.1	1.1
Lullingstone No. 1.	128	0.1	1	100.0	-	100.0	-
Lullingstone No. 2	123	0.1	12	99.2	-	99.2	-
Southfleet	241	0.1	95	98.8	-	99.2	-
Wilmington.	250	1.8	47	89.6	0.1	94.6	0.1
	2198						
1969							
Darenth	250	0.1	13	100.0	-	100.0	-
Dartford	245	0.4	4	100.0	-	100.0	-
Eynsford No. 1	169	0.2	30	99.4	-	100.0	-
Eynsford No. 2	174	0.1	4	99.4	-	99.4	-
Green St.Green No.1	168	0.1	3	94.0	0.1	97.6	0.1
Green St.Green No.2	82	0.1	2	98.0	0.1	98.8	-
Horton Kirby No. 1	196	0.2	73	91.8	0.4	94.9	-
Horton Kirby No. 2	199	0.1	15	94.5	0.2	96.5	0.3
Lullingstone No. 1	166	0.1	2	99.4	-	99.4	-
Lullingstone No. 2	138	0.1	1	99.3	-	100.0	-
Southfleet	241	0.1	24	98.8	-	100.0	-
Wilmington	238	0.5	46	98.8	-	99.6	-
	2266						

CHEMICAL ANALYSES

Sampling by Metropolitan Water Board Average Results

Well	No. of samples	Ammonia Nitrogen p.p.m.	Albuminoid Nitrogen p.p.m.	Nitrate Nitrogen p.p.m.	Oxygen absorbed in 4 hrs at 27°C	Hardness Total p.p.m.	Hardness (non-carb) p.p.m.	Chlorides as Chlorine p.p.m.	pH	Natural Fluoride as Fluorine p.p.m.	Conductivity reciprocal megohms
1966 Darenth	4	0.012	0.041	4.6	0.11	273	42	18	7.1		510
Dartford	4	0.005	0.036	3.7	0.15	281	59	20	7.1		520
Eynsford	8	0.010	0.018	3.9	0.13	268	40	17	7.2		470
Green St.Green	5	0.010	0.023	6.0	0.07	282	31	19	7.2		510
Horton Kirby	8	0.004	0.031	4.3	0.11	270	46	17	7.1		470
Lullingstone	8	0.012	0.023	3.2	0.16	258	31	14	7.2		470
Southfleet	5	0.007	0.040	6.4	0.09	309	44	21	7.1		560
Wilmington	4	0.008	0.049	7.5	0.35	303	67	25	7.1		570
1967											
Darenth	4	0.009	0.033	4.7	0.10	270	46	18	7.3	0.15	510
Dartford	4	0.003	0.034	4.3	0.12	272	50	22	7.3	0.15	540
Eynsford	8	0.009	0.030	4.0	0.08	265	37	15	7.3	0.10	500
Green St.Green	8	0.012	0.033	6.4	0.06	289	45	17	7.1	0.10	540
Horton Kirby	8	0.004	0.031	4.8	0.08	268	44	19	7.2	0.15	520
Lullingstone	8	0.004	0.025	4.0	0.14	259	33	15	7.3	0.10	500
Southfleet	4	0.005	0.024	7.4	0.08	309	54	18	7.1	0.15	580
Wilmington	4	0.008	0.037	7.3	0.15	286	54	26	7.3	0.20	590

CHEMICAL ANALYSES

Sampling by Metropolitan Water Board Average Results

Well	No. of samples	Ammonia Nitrogen p.p.m.	Albuminoid Nitrogen p.p.m.	Nitrate Nitrogen p.p.m.	Oxygen absorbed in 4 hrs at 27°	Hard-ness Total p.p.m	Hard-ness (Non-Carb) p.p.m.	Chlorides as Chlorine p.p.m.	pH	Natural Fluoride as Fluorine p.p.m.	Conduct-ivity reciprocal megohms
1968											
Darenth	4	0.009	0.025	4.6	0.12	272	46	18	7.3	0.15	500
Dartford	4	0.007	0.024	4.2	0.15	275	53	21	7.2	0.15	520
Eynsford	8	0.003	0.026	3.8	0.10	268	44	18	7.3	0.15	470
Green St.Green	8	0.008	0.025	5.9	0.09	283	44	19	7.3	0.10	530
Horton Kirby	8	0.009	0.023	3.8	0.10	271	50	19	7.3	0.15	490
Lullingstone	8	0.009	0.023	3.6	0.09	258	37	16	7.3	0.15	470
Southfleet	4	0.005	0.019	7.1	0.08	307	53	21	7.2	0.15	540
Wilmington	4	0.010	0.026	6.5	0.21	296	65	26	7.3	0.15	550
1969											
Darenth	4	0.006	0.016	4.6	0.12	276	54	18	7.4	0.15	490
Dartford	4	0.005	0.028	4.8	0.18	282	63	21	7.3	0.15	510
Eynsford	8	0.008	0.018	4.7	0.08	272	51	16	7.2	0.10	480
Green St.Green	8	0.008	0.018	6.4	0.06	296	52	19	7.1	0.10	520
Horton Kirby	8	0.019	0.025	4.7	0.12	277	58	20	7.3	0.15	500
Lullingstone	8	0.008	0.020	4.5	0.04	265	43	15	7.2	0.10	470
Southfleet	4	0.010	0.027	7.5	0.06	312	63	20	7.2	0.08	540
Wilmington	3	0.011	0.033	7.6	0.12	295	70	27	7.3	0.15	560

TABLE LVII NITRATE NITROGEN IN WELL WATERS. DARTFORD AND DISTRICT

Parts per million

The World Health Organisation regards 12 p.p.m. as a level which when exceeded nplies a possibility of infantile metahaemoglobinaemia.

Dartford Borough

West Hill Hospital

51 samples	1953-69	6-14
	1970 Mar.	15
	Nov.	7.5
	1971 Jan.	8

J & E. Hall

Works	1953 Feb.	3
Victoria Road	1957 Feb.	14.3
Hythe Street	1958 Oct.	8
	Oct.	14

Dartford Paper Mills

Well C	1954 Mar.	11
Shed 5	1954 Mar.	8
3 throw pump	1954 Mar.	5
-do-	1954 Jan.	7
69 Priory Road	1952 Mar.	9

(One of 7 houses supplied by the Paper Mills-now changed to M.W.B.)

Bexley Hospital

	1963 Mar.	6

London Paper Mills

No. 2 bore	1953 Jun.	6
No. 3 "	1955 Jan.	7
No. 1 "	1956 Feb.	3
No. 1 "	1965 Jun.	3
No. 1 "	1965 Jun.	6

Greaseproof Paper Mills

	1956 Feb.	10

Burroughs Wellcome

No. 3 bore	1952 Jun.	12.5
No. 1 "	1953 Feb.	2

Stanham Farm

1952 Feb.	6
1954 May	7
1954 Nov.	7
1958 July	10
1958 Sept	7
1958 Nov.	9

Dartford Rural District

Parish of Horton Kirby or vicinity

Paper Mills	1957 Aug	6
	1957 Oct	4
Court Lodge Farm		
	1948 Feb	7
	1948 July	6
	1949 Apr.	13
	1949 Jun	6
	1949 Dec	17
	1949 Dec	17
	1950 May	

Devon Cottages*	1948 Aug.	12.5

Court Lodge Farm (continued)

1951 Sept.	16.7
1948 Feb.	8
1949 May	17
1949 Aug	10
1949 Oct	10
1950 May	7.0

Parish of Sutton-at-Hone or vicinity

Clement Street

Ayre's Cottages, 2 wells*

1949 Mar.	10.0
1949 Sept.	7
1949 Nov.	3
1950 Jan.	9.0
1950 Jan.	9.0
1950 Jan.	5.0
1951 Aug.	12.5
1952 Sept	3.0

Ayre's Cottages (continued)

1954 Jun	10.0
1954 Jun	10.0
1956 Aug	12.5
1956 Aug	11.1
1957 Mar	8.0
1957 Mar	11.1
1957 July	7.0
1957 July	7.0

*Well no longer in use.

TABLE LVII NITRATE NITROGEN IN WELL WATERS. DARTFORD AND DISTRICT (continued)

Parts per million

Dartford Rural District (continued)

Parish of Sutton-at-Hone (continued)

Clement Street (continued)

Ayre's Nursery

1956	Aug	10.0
1957	Mar	8.0
1957	July	7.0

Clement House, Sutton Cottages, Northview*

1949	April	8
1948	Aug.	4
1949	Mar	10
1949	Aug	10
1951	Aug	10.0
1949	May	4
1949	Nov.	3
1950	Jan	7.0
1954	Aug	8.0
1957	Mar	8.0
1957	July	5.0

The Ferneries*

1949	Dec	8

Parish of Stone

Stone House Hospital*

1953	Feb	15
1953	May	7.0
1953	July	7.0
1954	June	20

Stone Court Works

1949	Jan	10
1949	Aug	7

Brickfield Cottages*

1948	Nov	11.0
1949	May	8
1949	July	5
1950	Jan	8.0
1950	Sept	6.0
1951	Oct	1.0

Claypit Well, Bean*

1950	June	2.0	(Shellbank)+
1949	July	9.0	
1957	Aug	5	
1951	Mar	6.0	(Shellbank)+
1948	June	1	(Shellbank)+

+mixed with rainwater

Fenn's Cottages *

1949	Nov.	4
1950	Jan.	9.0
1950	Aug.	8.0

Whiffen's Cottages *

1949	Mar	10
1949	Nov	8
1956	Aug	8.0
1957	Mar	8.0
1959	July	6.0

Orchardside**

1949	Apr	7.0
1954	Jan	7.0
1950	Jan	6.0
1956	Aug	12.5
1957	Mar	10.0
1957	July	4.0

Thomas's Nursery

1948	Feb	11

Parish of Darenth

Darenth Park Hospital

1951	July	6.0	
1951	July	7.0	(mixed with MWB)
1965	Aug	4.5	
1971	Nov	2.0	

Darenth Mill

1950	Oct	2.0
1951	Nov	4.0
1957	Aug	6
1957	Oct	3

Parish of Eynsford

Lullingstone Castle

1948	Nov	7
1950	May	6
1950	Dec	4.0
1951	June	5.0
1951	July	6.0
1951	July	5.0
1952	Sept	1.0
1963	July	3
1965	Aug	0
1966	Aug	5
1968	Apr	5.0

*well no longer in use

**well no longer in use for human consumption

TABLE LVII NITRATE NITROGEN IN WELL WATERS. DARTFORD AND DISTRICT (continued)

Parts per million

Swanscombe U.D.

The Empire Paper Mills are supplied by two wells at Cobham Terrace and one at Southfleet Road. The precise well from which water has been sampled is not always certain.

1952	January	4.0	
1953	July	10	
1954	April	8	
1956	November	4	
1956	December	8.4	(Cobham Terrace well)

Water Authorities

The annual averages for samples from wells of the water authorities are given in the attached table.

The individual readings on which certain M.W.B. high averages were based were:

Wilmington	1961	Feb	8.0
		May	9.0
		Aug	10.0
	1962	Feb	9.0
		May	8.0
		Aug	10.0
		Nov	10.0
Green Street Green	1960	Mar	6.0
		May	6.5
No.1 well		Sept	7.5
No.2 well		Sept	7.5
		Dec.	8.0
No.1 well	1961	Mar	not determined
No.2 "		Mar	5.5
No.1 "		June	8.0
No.1 "		Sept	8.0
No.2 "		Sept.	7.0
No.1 "		Dec.	7.0

Southfleet	1967	Feb	7.0
		Apr	8.0
		Aug	7.4
		Nov	7.0
	1968	Feb	6.5
		Aug	6.5
		Nov	6.7
		Dec	8.7
	1969	Feb	8.0
		May	6.4
		Aug	6.9
		Nov	8.1

Certain of the above readings are given to one place of decimals others to the nearest whole number hence the variation in presentation.

TABLE ~~XXX~~ LVIII CHEMICAL RESULTS NITRATE NITROGEN

Individual wells of water undertakers

Nitrate nitrogen p.p.m.average readings of each year

Rawwater except where otherwise stated Well	Average nitrate nitrogen										Number of samples on which each average is based									
Met.Water Board	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Darenth	5.5	4.5	5.3	4.8	5.1	5.0	4.6	4.7	4.6	4.6	6	4	4	5	4	4	4	4	4	4
Dartford	5.2	4.6	4.0	4.1	4.9	4.0	3.7	4.3	4.2	4.8	5	4	4	4	4	4	4	4	4	4
Eynsford	4.1	4.1	3.7	3.7	4.2	3.6	3.9	4.0	3.8	4.7	7	8	8	7	8	8	8	8	8	8
Green St.Green	7.1	7.1	6.6	6.3	6.3	5.3	6.0	6.4	5.9	6.4	5	6	7	8	8	7	5	8	8	8
Horton Kirby	4.5	4.8	4.2	4.4	4.8	4.5	4.3	4.8	3.8	4.7	6	8	8	8	8	8	8	8	8	8
Southfleet	6.2	5.1	6.0	5.6	6.6	6.1	6.4	7.4	7.1	7.5	3	4	4	4	4	4	5	4	4	4
Wilmington	7.8	9.0	9.3	6.9	8.3	6.9	7.5	7.3	6.5	7.6	3	3	4	3	6	4	4	4	4	3
Lullingstone	-	-	-	3.4	4.0	3.1	3.2	4.0	3.6	4.5	-	-	-	6	8	8	8	8	8	8
Medway Water Board																				
Fawkham well(tr.+raw)		5.1	5.2	4.9	5.3	5.0	4.4	4.5	4.0	4.0	-	5	3	6	4	4	5	5	7	6
Northfleet well(a)	-	-	-	4.6	5.0	5.1	4.9	4.6	4.9	4.5	-	-	-	5	4	4	3	4	5	7
" " (b) (b = treated)	-	-	-	5.5	5.2	5.0	4.9	5.5	5.7	6.6	-	-	-	3	4	2	3	3	4	4
Mid Kent Water Co.																				
Hartley Pumping Station (treated & raw)	5.0	5.0	5.3	5.3	5.6	6.5	4.7	4.4	4.7	4.8	4	2	6	2	3	1	7	3	6	6
Stansted Pumping Station	-	-	-	-	-	-	2.9	2.7	-	-	-	-	-	-	-	-	4	1	-	-

TABLE LVIII DRAINAGE

DRAINAGE WORK.

Works carried out by or on the instigation of the Council's Public Health Inspectors were as follows:-

		1966	1967	1968	1969
Drains -	cleared by service of notice	2	3	4	2
	cleared by department	482	448	524	486
	reconstructed	-	-	3	3
	repaired	6	5	1	2
	gully fenders repaired	2	-	3	2
	inspection chambers provided	-	1	-	-
	inspection chambers repaired	13	6	11	5
	vent shafts or fresh air inlet repaired	-	2	3	2
Cesspools -	emptied	2	-	-	-
	repaired	-	-	-	-
	abolished				
Drainage work -	drains tested by water	24	22	16	14
	drains tested by smoke, colour etc.	5	9	6	3
	visits in respect of repairs	95	92	figures	
	visits in respect of obstructions	394	196	included with other works	

Where main drainage was not in use the position was:-

		Dec.1965	1969
Domestic premises -	Cesspool (foul and sink waste)	38	about 20
	Cesspools for foul water only	1	
	Cesspools for sink with earth or chemical closets	2	
	Septic tanks	7	
Factories -	with cesspools	4	about 6
	with septic tanks	4	
	with chemical closets	4	

Some of the cesspools are emptied by the Council, some are emptied by other arrangements, others are never emptied.

WEST KENT MAIN SEWERAGE WORKS.

For the years 1966-69 typical figures for analysis were:

Suspended solids	140 p.p.m.
Oxygen absorbed in 4 hours at 27°C	45 p.p.m.

New sewers and sedimentation plant came into use in 1960. Consent for secondary treatment plant was applied for in 1967 but not given until 1970. These works contribute 4% of the pollution load of the tidal Thames.

No bacteriological analyses of the effluent are available. The last information we have on this relates to the results of the culturing of specimens of wet and dried sludge in 1956-1957. The following organisms were then isolated -

S. paratyphi B type taunton
S. paratyphi B type 3a
S. derby
S. senftenberg
S. taksony
S. thompson
S. new brunswick
S. give
S. unidentified

TABLE ~~XXXII~~ LIX - DRAINAGE (continued)

STANDARDS FOR SEWAGE EFFLUENTS ENTERING R.THAMES (1933)

	Limits
Teddington to London Bridge	30 ppm suspended matter 20 ppm dissolved O_2 absorbed in 5 days
London Bridge to 20 mile pt Long Reach	Alb.ammonia 5.0 ppm O_2 absorbed in 3 hrs at $37^{\circ}C$ 50.ppm
20 mile pt Long Reach to Lower Hope	Alb.ammonia 7.0 ppm O_2 absorbed in 3 hrs at $37^{\circ}C$ 70 ppm.

THE RIVER THAMES

"In order to improve the condition of the Thames it is essential that a high reserve of dissolved oxygen be maintained in the river. The maximum amount of oxygen that can be dissolved into a given quantity of water is termed the 100% saturation value and the Port of London Authority have set a target of a minimum oxygen content of 10% saturation in all places and at all times in the tidal Thames to be achieved by 1980". At Long Reach within the boundary of this district the tidal Thames as it lowest oxygen content.

Long Reach		Dissolved oxygen (per cent saturation)		Averages
Flow 250 mgd	Teddington	1893	Third quarter	25% approx
"	"	1900-05	" quarters	25% "
"	"	1920-29	" "	8% "
"	"	1930-39	" "	6% "
"	"	1940-49	" "	5% "
"	"	1950-59	" "	0% "
1848	"	1968	year	15% "
1420	"	1969	"	18% "
1170	"	1970	"	12% "

The contributions in this area to the improvements of the 1960's included the reconstructions of the Crossness sewage works, the extension of sedimentation plant at the West Kent Main Sewerage Board Works, the closure of the small inefficient sewage works at Stone, the improvement of the small works at Swanscombe.

From 1964 onwards fish were periodically caught by the screens of Littlebrook and West Thurrock Generating Stations.

The improved oxygenation of the river appears also to be amenable to the organisms of the soil and intestine arriving in the effluents from the sewage works along the banks of the tidal Thames.

P.L.A. survey of River Thames 6. 10. 69

	Coliforms per 100 ml.	E coli per 100 ml.	Salmonellae per litre	Salmonellae isolated
		Samples at high water		
Southend	8	3	0	
Gravesend	130	80	3	Enteritis + unnamed
Long Reach	14000	3000	13	Bredeney
Halfway Reach	25000	8000	13	Bredeney,Newport
Barking Reach	17000	8000	725	Bredeney
Woolwich	30000	5000	725	Bredeney,Reading
Limehouse	25000	5000	13	Typhimurium, Dublin
Lower Pier	11000	1000	5	Typhimurium
Chelsea	50000	20000	3	Brandenburg
		Samples at half flood		
Corney Reach	13000	1000	13	Paratyphi B.Typhimurium,Stanley New-haw
Syon Reach	90000	1000	5	Typhimurium.Fischerkietz

TABLE LX FOOD HYGIENE

REGISTERED PREMISES

Dairy Farms. On the 31st December the Ministry of Agriculture, Fisheries and Food had on their register

	1966	1967	1968	1969
Dairy farms	1	1	1	1
Dairy farmers	1	1	1	1
Producers licences for untreated milk	-	-	-	-

Dairies other then dairy farms

	1966	1967	1968	1969
On the 31st December this Council had on their register	2	1	1	1

Milk Dealers. As food and drugs authority this Council had in force at the end of each year the following licences for special designations

	1965	1966	1967	1968	1969
Untreated	1	1	-	-	-
Pasteurised	22	27	33	34	34
Sterilized	29	30	31	31	31
Ultra heat treated	-	2	3	5	5

Milk Distributors. Regulations require this Council to require each dealer other than a dairy farmer licenced above to be registered as a distributor. The premises from which the milk is distributed are thus known to this office.

1966	1967	1968	1969
34	53	55	55

Other premises. The Food and Drugs Acts require certain other premises to be registered by this Council. Those registered on December 31st were as follows:-

	1966	1967	1968	1969
Sausage making and cooked meats	32	28	28	32
Ice cream manufacture and sale	1	1	1	1
Ice cream storage and sale	91	91	91	91

IMPORTED FOOD

There is one depot which receives consignments of imported food, mainly fruit juices. Inspections are made when necessary by the Council's Public Health Inspectors.

EXPORTED FOOD

There is no depot for the export of food.

FOOD PREPARATION

The following inspections were carried out by the Council's Public Health Inspectors:

	Premises				Inspections			
	1966	1967	1968	1969	1966	1967	1968	1969
Bakehouses	6	6	6	6	47	26	14	16
Butchers	26	25	25	25	163	88	68	98
Cafes, restaurants, canteens etc	70	70	70	65	373	262	193	156
Confectioners - Sugar confectionery	41	43	43	31	166	151	123	113
- Flour confectionery	7	7	7	7				
Dairies	2	1	1	1	5	2	3	1
Fish fryers and fishmongers	14	12	12	12	78	38	26	38
Greengrocers	18	18	18	21	119	210	178	223
Grocers	63	57	57	53	385	136	134	172
Ice-cream premises(incl.manufacturers)	91	91	91	91	73	37	139	22
Licensed premises (non-catering)	40	38	38	38	119	94	89	98
Slaughterhouses	1	1	1	1	68	56	46	18
Butchers stalls in market	1	1	1	1	51	55	53	51
Grocers stalls in market	1	3	3	3	56	124	111	153
Fishmongers stalls in market	1	1	1	1	55	56	57	51

TABLE LX FOOD HYGIENE (continued)

ood Preparation (continued)

Although two premises were registered as dairies in 1966 only one was used as uch and this only on rare occasions. The main function of the latter premises after 966 was as a store for bottled milk and sealed churns.

Most of the ice-cream premises registered were grocers or confectioners.

OOD HYGIENE REGULATIONS.

As a result of the foregoing inspections the following notices were served:-

	1966	1967	1968	1969
Served	61	86	86	50
Complied with	52	67	67	54

he following summarizes the defects remedied:-

	1966	1967	1968	1969
Premises and equipment cleansed, repaired or improved	77	56	20	63
Personnel and clothing, provision for cleanliness and first aid dressings	15	14	9	3
Protection of food from risk of contamination	6	9	5	5
Sanitary accommodation, repair and cleanliness, and refuse storage	14	16	20	15
Miscellaneous	1	5	1	8
ood vehicles and Stalls				
Name and address not on vehicle	3	11	-	10
Absence of protective clothing	-	15	-	8
Inadequate wash hand basins or sinks	-	12	2	1
Inadequate hot water supply	2	15	1	8
Inadequate provision of nail brushes etc.	2	41	1	4
Inadequate washable dressings	2	13	-	3
Inadequate screening of stalls	-	4	-	6
Insufficient receptacles for waste food	-	2	1	1
Dirty vehicle or stall disrepair	4	-	-	3

EAT INSPECTION. The following relate to carcases inspected by the Council's ublic Health Inspectors at the slaughterhouse of Bexley Mental Hospital.

		Cattle excl. Cows		Cows		Calves		Pigs	
umber killed. All inspected	1966	4	5	14	49	13	96	1084	3371
	1967	1		31		42		1197	
	1968	-		3		33		833	
	1969	-		1		8		257	
iseases other than tuberculosis nd cystercercosis									
Whole carcases rejected	1966	-		-		-	2	1	6
	1967	-		-		-		1	
	1968	-		-		1		2	
	1969	-		-		1		2	
Carcases of which some part or organ was rejected	1966	-		8	13	-		178	352
	1967	-		4		-		61	
	1968	-		-		-		71	
	1969	-		1		-		42	
uberculosis									
Whole carcases rejected	1966/1969	-		-		-		-	
Carcases of which some part or organ was rejected	1966	-		-		-		12	26
	1967	-		-		-		10	
	1968	-		-		-		2	
	1969	-		-		-		2	
ystercercosis	1966/1969	-		-		-		-	

TABLE LXI FOOD HYGIENE (continued)

URRENDER OF UNSOUND FOOD

The amount of food surrendered was

	1966 lbs.	1967 lbs.	1968 lbs.	1969 lbs.
Raw meat slaughterhouse	1294	576	528	170
Raw meat retail shops	1302	660	2787	1143
Cooked meat	-	-	-	1
Canned meat	331	585	397	460
Other canned food	see "other"	277	635	545
Fish (fresh)	505	192	220	191
Fruit and vegetables (fresh)	see "other"	-	10988	-
Other foods	9502	1878	5489	1156

EIZURE OF UNSOUND FOOD

None

OD UNFIT FOR CONSUMPTION EXPOSED FOR SALE

Items of food the fitness of which was the subject of complaint to the public ealth office were :-

	1966	1967	1968	1969
Tainted "off" or old	2	5	7	5
Moulds	7 (2)*	3	4	6 (2)*
Insects and their larvae	2	7	1	2
"Dirt" etc.	1	-	1	-
Not unfit	8	several	4	1

*( ) = legal proceedings

ABORATORY TESTS

MILK. For possesion of a dealers licence for the sale of milk, the milk sold must satisfy tests prescribed for the designation under which it is sold. The following samples were submitted to the Borough Analyst by the Council's Public Health Inspectors.

		Number of samples							
Designation	Prescribed test	Examined				Failed			
		1966	1967	1968	1969	1966	1967	1968	1969
Untreated	Methylene blue	-	-	-	-	-	-	-	-
Pasteurised	(Methylene blue	22	14	10	16	-	-	1	1*
	(Phosphatose					-	-	-	-
Sterilized	Turbidity	5	4	4	4	-	-	-	-
Ultra-heat treated	Colony count	-	-	-	-	-	-	-	-

*invalid

ICE CREAM. Ice cream is tested for cleanliness by the time it takes to bleach methylene blue. Anything shorter than 2½ hours (i.e. grades III and IV) means that the conditions of manufacture and handling require investigation. The results of samples submitted to the laboratory by the Council's Public Health Inspectors were as follows:-

Manufactured in the Borough	1966	1967	1968	1969
Soft ice cream				
I	7	4	5	5
II	-	3	3	-
III	1	-	-	-
IV	1	1	-	-
Loose ice cream				
I	-	-	-	3
II - IV	-	-	-	-

/continued...

TABLE LXI FOOD HYGIENE (continued)

ABORATORY TESTS (continued)

CE CREAM (continued)

Manufactured outside the Borough	1966	1967	1968	1969
prepacked				
I	3	4	2	2
II	1	1	-	-
III	-	-	3	-
IV	-	-	-	-
loose ice cream				
I	-	-	-	5
II - IV	-	-	-	-
soft ice cream				
I	3	4	-	1
II	-	1	-	-
III	2	-	-	-
IV	-	-	-	-

EGAL PROCEEDINGS

Food and Drugs Act 1955

Section 2

	Fine	Costs(Advocate's fee)
966		
Mould, corned beef (offence 1965)	£25	£5. 5
" steak pie	£10	£5. 5
" " "	£10	£5. 5
" milk (offence 1965)	£20	£4. 4
Insect in pork pie (offence 1965)	£10	£5. 5
Canned raspberries with dissolved metal (offence 1965)	£10	£4. 4
967		
Insects in biscuits	£5	£5. 5
969		
Mould, chicken pie	£5	£5. 5
" apple pie	£5	£5. 5
Section 8		
967 Unfit sausages	£20	£5. 5
Section 22		
966		
No address on vehicle	£2	£3. 3
" " " "		
Food Hygiene (General) Regulations 1960		
966		
Cigarette smoking handling melons	£5	£2. 2
No soap on vehicle	£10)	£3. 3
No towel on vehicle	£10)	
No soap on vehicle		
No towel on vehicle		
No head covering while carrying carcase	£5	£5. 5
" " " " " "	£5	£5. 5
" " " " " "	£5	£5. 5
Food Hygiene (Market Stalls & Delivery Vehicles) Regulations 1966		
968		
Contravention of meat carrying provision	£5	
" " " " "	£2	£3. 3
" " " " "	£2	
969		
No washable overclothing)	£3	£5. 5
No first aid equipment)		

TABLE LXII FOOD CONTENT

Samples taken by the Council's Public Health Inspectors or received from the public were as follows. Except for two formal samples in 1967 all samples taken by the Public Health Inspectors were informal.

	1966	1967	1968	1969
Milk	29	18	15	20
Drugs	1	3	-	4
Spirits	-	-	-	-
Other samples	112	114	110	78
	142	135	125	102

The following were unsatisfactory :

	1966	1967	1968	1969
Milk	-	1	1	2
Drugs		1	-	-
Spirits	-	-	-	-
Other samples	16	24	14	12
	16	26	15	14

Certain of the unsatisfactory items are listed as unfit food in the previous table. In addition the complaints from customers produced the following with unsatisfactory food content.

1966

Wire in bread
"   "   "
Foreign matter in luncheon meat
"   "   " orange drink
Plastic band in milk bottle

1967

Abscess inside meat joint
Metal in sausages
Stones in sultanas
Foreign matter in bread
Label in bread

1968

Bone in mince meat
Vegetation in honey
Glass in milk
Glass in meat and vegetable mince
Foreign matter in chutney
Foreign matter in mince
Screw in doughnut

1969

String in bread
Paper clip in bread
Cigarette end in chipped potatoes
Pebbles in raspberries

LEGAL PROCEEDINGS
Food and Drugs Act 1955 Sec. 2

	Fine	Costs (Advocate's fee)
1966		
Wire in bread	£25	£10.10
1967		
Sausages of inferior quality	£15	£5.5
Orange juice with foreign matter	£20	£5.5

TABLE LXIII PLACES OF WORK

(a) Offices, Shops and Railway Premises Act

This Act makes provision for the safety, health and welfare of persons mployed in offices, shops and certain railway premises.

Local Authorities enforce the general provisions in most office and shop remises and the following relates to the work done on behalf on this Council by he Council's Public Health Inspectors.

Number of registered premises at end of each year

Class of premises	1964	1965	1966	1967	1968	1969
Offices	77	94	100	100	106	103
Retail shops	219	269	285	256	256	248
Wholesale shops, warehouses	6	6	5	4	4	4
Catering establishments open to the public, canteens	27	39	36	40	38	36
Fuel storage depots	1	1	1	1	1	nil
	330	409	427	401	405	391

Number of registered premises receiving one or more general inspections during the year

	1964	1965	1966	1967	1968	1969
Offices	77	21	54	93	79	85
Retail shops	205	88	254	222	223	221
Wholesale shops, warehouses	6	1	1	4	1	2
Catering establishments open to the public, canteens	23	14	17	38	33	36
Fuel storage depots	1	nil	nil	1	1	1
	312	124	326	358	337	345

Approximate analysis of persons by sex employed in registered premises by workplace at time of registration 1964

Class of workplace	M	F	Total
Offices	462	449	911
Retail shops	604	1157	1861
Wholesale departments, warehouses	81	14	95
Catering establishments open to the public	65	143	207
Canteens	-	17	17
Fuel storage depots	3	-	3
	1215	1779	2994

Analysis of persons employed in registered premises by workplace at end of year

Class of workplace	1965	1966	1967	1968	1969
Offices	995	994	983	1009	1303
Retail shops	1900	1926	1977	1970	1947
Wholesale departments, warehouses	115	115	89	102	129
Catering establishments open to the public	256	242	264	271	275
Canteens	17	17	16	16	21
Fuel storage depots	3	3	3	3	nil
Total	3286	3297	3332	3371	3675
Total males	1180	1186	1266	1283	1477
Total females	2106	2111	2066	2088	2198

TABLE LXIII PLACES OF WORK (continued)

(a) Offices, Shops and Railway Premises Act (continued)

FECTS FOUND ction		1964	1965	1966	1967	1968	1969	1964-69
4	Unclean premises	-	3	1	-	3	1	8
5	Overcrowding	1	1	-	1	-	-	3
6	Inadequate heating	2	18	20	17	6	1	64
6	Absence of thermometer	111	148	21	17	9	12	318
7	Inadequate ventilation	1	6	5	-	1	1	14
9	Inadequate lighting	-	9	9	4	4	4	30
9	Inadequacy of sanitary conveniences	6	15	-	1	-	1	23
9	Sanitary conveniences not marked M	21	36	1	6	-	1	65
9	" " " " F	20	30	1	5	-	1	57
9	Defective sanitary conveniences	3	3	7	3	1	4	21
9	No means of disposal of san. dressings	2	4	-	-	-	-	6
10	Defect.washing facilities(no hot water)	34	48	12	2	3	12	111
10	Inadequate washing facilities(separate w.h.bs.not provided for male and female employees)	6	7	-	-	1	-	14
10	Extra wash hand basins required for numbers employed	2	13	-	1	-	-	16
11	Absence of drinking water or utensils	-	2	-	-	1	-	3
12	Inadequate cloakroom facilities	2	9	1	-	1	1	14
13	Inadequate seats	1	20	2	-	-	-	23
14	Unsuitable seats	-	3	1	-	-	-	4
15	Inadequate facilities for taking meals	1	1	-	-	-	-	2
16	Offences in relation to floors, passages and stairs	3	3	17	15	10	6	54
19	Offences in relation to safeguarding machinery	-	4	6	4	3	5	22
24	Inadequate first aid facilities	81	150	24	14	11	10	290
50	Abstract (requirement only since 1.6.65)		52	58	33	14	30	187
		297	585	186	123	68	90	1349

ECTS REMEDIED		1965	1966	1967	1968	1969	1965-69
4	Unclean premises	2	2	-	-	2	6
5	Overcrowding	-	2	1	-	-	3
6	Inadequate heating	15	10	22	16	-	63
6	Absence of thermometer	243	29	24	7	11	314
7	Inadequate ventilation	5	6	1	1	1	14
9	Inadequate lighting	5	12	6	1	5	29
9	Inadequacy of sanitary conveniences	12	5	-	-	2	19
9	Sanitary conveniences not marked M	55	3	6	-	1	65
9	" " " " F	47	4	5	-	1	57
9	Defective sanitary conveniences	3	9	3	2	3	20
9	No means of disposal of sanitary dressings	3	-	-	-	-	3
0	Defective washing facilities(no hot water)	64	25	5	3	9	106
0	Inadequate washing facilities(separate wash hand basins not provided for male and female employees)	4	6	1	-	1	12
0	Extra wash hand basins required for numbers employed	12	3	-	-	1	16
1	Absence of drinking water or utensils	2	-	-	-	1	3
2	Inadequate cloakroom facilities	9	2	-	-	1	12
3	Inadequate seats	18	3	-	-	-	21
4	Unsuitable seats	1	2	1	-	-	4
5	Inadequate facilities for taking meals	2	-	-	-	-	2
6	Offences in relation to floors, passages and stairs	5	12	16	9	7	49
9	Offences in relation to safeguarding of machinery	2	8	4	2	6	22
4	Inadequate first aid facilities	218	27	22	9	9	285
0	Abstract (requirement only since 1.6.65)	44	58	37	11	29	179
		771	228	154	61	90	1304

TABLE LXIV PLACES OF WORK

(a) Offices, Shops and Railway Premises Act (continued)

CCIDENTS

An accident is notifiable if it causes death to an injured person employed on he premises or disables him for more than three days from doing his usual work.

Age	Sex	Cause	Injury	Workplace
964				
19	F	Handling goods	Sprained back	Catering establishment open to public
965				
47	M	Fall on same level slippery surface	-do-	Office
45	F	Fall from stepladder while handling goods	Sprained ankle	Retail shop
45	F	Fall downstairs	Sprained right knee	" "
39	F	Fall on same level	Bruised leg, cuts and abrasions to left hand	" "
21	M	Handling cutting instrument	Cut on right leg	" "
19	M	Injury when opening door	Cuts and bruised face	" "
57	F	Tripped on edging of bottom tread	Strained back	" "
19	F	Slipped on stairs	Concussion	" "
966				
42	F	Fell when heel of shoe caught in trolley	Cut head	" "
32	F	Fall downstairs	Sprain left ankle	Office
26	M	Handling heavy meat	Sprain back	Retail shop
55	F	Fell on wet path, rubber soled shoes	Sprain right ankle	" "
967				
42	M	Pain on bending low	Pain in back	" "
15	M	Handling sacks of potatoes	Hernia	" "
40	F	Leg struck edge of stand	Cut on left leg	" "
17	F	Fall downstairs	Injury to back	" "
72	M	Knife slipped when opening case	Cuts on two fingers	" "
968				
17	M	Fell backwards when standing on a fixed seat	Sprained ankle	" "
54	F	Fall on same level	Broken left ankle	Office
24	M	Bone caught up under nail while handling meat	Injury to middle finger right hand followed by sepsis	Retail shop
57	F	Finger caught in door	Crushing of third finger	" "
50	F	Fall downstairs	Fracture of bone in ankle	Catering establishment
60	F	Barrow went over foot	Bruised toes and ankle	Retail shop
56	M	Slipped on step	Sprained ankle	" "
16	F	Fell over box in gangway	Sprain and bruise right arm	" "
17	F	Slipped and fell	Lumbar strain	" "
63	F	Fall from box	Back injury	" "
47	F	Cut finger with knife while preparing food	Open wound first finger left hand	" "
60	F	Bent down to lift box	Sprained back	" "
969				
58	F	Hit knee on radiator	Swollen right knee	" "
15	F	Bent down to lift basket	Strained ligament knee	" "
41	F	Fall on stairs	Strained foot	" "

TABLE LXIV PLACES OF WORK (continued)

(a) Offices, Shops and Railway Premises Act (continued)

CCIDENTS (continued)

Age	Sex	Cause	Injury	Workplace
1969 (continued)				
27	M	Fall downstairs	Injury to waist and leg	Retail shop
50	F	Fall downstairs	Bruising to back	Catering establish.
50	F	Over-reaching, broke blood vessel	Injury to left leg and knee	Retail shop
66	F	Fell over cleaners bucket while carrying loaded tray	Cut, bruises and swelling of right leg	" "
38	F	Fall on stairs	Sprain left foot	" "
37	M	Cutting meat on hand saw	Cut finger right hand	" "
42	F	While bending down knocked eye on handle of bacon machine	Bruised left eye	" "

No accident was fatal. None required investigation.

EGAL PROCEEDINGS

	Fine	Costs/Advocates fee
966		
ection 6(4) Failure to provide thermometer (conviction and absolute discharge)		
967		
ection 10(i) No hot water supply at wash-hand basin	£7	£2.2

UTIES OF OTHER AUTHORITIES

Other authorities enforce the remaining provisions of the Act.

H.M. District Inspector of Factories is responsible for enforcing the general rovisions in premises occupied by local authorities, in railway premises, fuel torage depots on railway land and offices in factories. He is also responsible or inspecting premises owned or occupied by the Crown.

Fire authorities enforce for the most part the fire provisions of the Act.

The relevant local information arising from these duties of other authorities s not available for this report.

(b) Shops Act

Inspections by the Council's Public Health Inspectors regarding the provisions of this Act are blended with those f the Offices, Shops and Railway Premises Act. Six notices were complied with n 1966 regarding half-day or Sunday closing offences.

TABLE LXV PLACES OF WORK (continued)

(c) Factories

Inspections 1966-69 by the Council's Public Health Inspectors.

Under the Factories Acts the district council enforces the following sections: (a) Section 7 (sanitary conveniences) in all factories (b) Sections 1,2,3,4, and 6 (cleanliness, temperature, ventilation and drainage of floors) in all factories where mechanical power is not used.

		Number on register	Number of inspections	Number of notices	Prosecutions
(i) Factories in which sections 1,2,3,4 and 6 are to be enforced by local authorities	1966	9	11	-	-
	1967	9	8	-	-
	1968	9	5		
	1969	6	6	-	-
(ii) Factories not included in (i) in which section 7 is enforced by local authority	1966	169	483	25	-
	1967	167	184	3	-
	1968	167	117	1	-
	1969	167	149	8	-
(iii) Other premises in which section 7 is enforced by local authority (excluding outworkers' premises, i.e. works of construction.	1966	8	17	-	-
	1967	9	47	3	-
	1968		11	-	-
	1969	3	3	-	-
Total (i) (ii) and (iii)	1966	186	511	25	-
	1967	185	239	6	-
	1968	176	133	1	-
	1969	176	158	8	-

NUMBER OF CASES IN WHICH DEFECTS WERE FOUND

		Found	Remedied	Referred to H.M. Inspector	Referred by H.M. Inspector	Prosecutions
Want of cleanliness(s.1)	1966-69	-	-	-	-	-
Overcrowding (s.2)	"	-	-	-	-	-
Unreasonable temperature(s.3)	"	-	-	-	-	-
Inadequate ventilation (s.4)	"	-	-	-	-	-
Ineffective drainage of floors(s.6)	"	-	-	-	-	-
Sanitary conveniences (s.7)						
(a) insufficient	1966	-	-	-	-	-
	1967	2	2	-	-	-
	1968	-	-	-	-	-
	1969	-	-	-	-	-
(b) unsuitable or defective	1966	25	27	-	3	-
	1967	7	12	-	3	-
	1968	1	1	-	-	-
	1969	8	7	-	-	-
(c) not separate for sexes	1966	-	-	-	-	-
	1967	-	-	-	-	-
	1968	-	-	-	-	-
	1969	-	-	-	-	-
Other offences against the Act (not including offences relating to outwork).	1966-69	-	-	-	-	-

TABLE LXV PLACES OF WORK (continued)

OUTWORKERS:	1966	1967	1968	1969
(a) Total number of outworkers notified to the Council by firms in Dartford Borough under section 110 (1c) Factories Act 1961	10	12	10	13
(b) Total numbers of outworkers notified by Dartford Borough Council to other Councils under section 110 (2) Factories Act 1961	15	10	10	12
(c) Total number of outworkers notified to Dartford Borough Council by other Councils under section 110 (2)	22	30	22	18
(d) Total number of outworkers employed in Dartford Borough	17	32	22	19
(e) Total number of inspections of workplaces under section 111 (1) Factories Act, 1961	5	7	6	7
(f) Nature of work followed by outworkers in Dartford Borough:				
Making wearing apparel	11	26	17	10
Making of boxes or other receptacles or parts thereof made wholly or partially of paper, cardboard, chip or similar material	-	-	-	-
Firework cases	4	6	4	6
Umbrellas	-	-	1	1
Not given	2	-	-	2

On the remaining features cared for by Factories Acts there is no local information available to the Council. These include:

Lighting of factories without mechanical power.
Ventilation, lighting, heating, cleanliness and floor drainage of factories using mechanical power.

Accidents. First Aid facilities. Protection measures.

Noise inside factories.

Toxic gases.

Notifiable industrial disease. **Prescribed occupational** disease.

Conditions of work for young employees.

Information on the above on a national scale is provided by the annual reports of H.M. Chief Inspector of Factories.

TABLE LXVI VERMIN

reatment of the following has been supervised by the Council's Public Health nspectors.

	Premises involved			
Rats and mice	1966	1967	1968	1969
Premises visited as a result of notification	250	385	608	563
Premises found to be infested by common rats	183	170	237	207
Premises found to be infested by the common house mouse	67	93	93	114
Pigeons				1

Insects, mites etc.	Complaints				Treatment				Premises			
	1966	1967	1968	1969	1966	1967	1968	1969	1966	1967	1968	1969
Bed bugs	12	2	11	7	8	5	12	9	8	5	10	8
Woodworm	-	-	-	1	-	-	-	-	-	-	-	-
Wasps	27	76	10	18	21	57	6	9	21	56	6	9
Fleas	3	2	6	8	2	2	4	4	2	2	4	4
Other insects	16	18	31	21	1*	1*	2*	8*	1	1	2	8

*clover mite

Lice. The following have been treated by the School Health Service

	1968		1969		1970		1971 (part)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Dartford Borough	2	14	15	19	3	6	6	12
Dartford Rural District	8	24	27	32	7	12	12	4
Northfleet U.D.C.	1	3	5	3	3	1	-	2
Swanscombe U.D.C.	-	-	-	2	1	1	-	-

Itch mite (scabies). The following have been treated by the Hospital or General Medical Service

	1966	1967	1968	1969
Dartford M. B. notifications	9	48	17	25

TABLE LXVII HYGIENE FACILITIES PROVIDED BY THE COUNCIL

LIPPER BATHS. The Council provide and maintain the public slipper baths and washing acilities at Spital Street. The number of persons using these were:

	1962	1963	1964	1965	1966	1967	1968	1969
Men	11,895	13,792	13,039	12,199	10,886	9,037	8,543	7,206
Boys	405	448	409	322	444	337	365	329
Women	3,473	3,597	3,200	2,929	2,551	1,904	1,866	2,023
Girls	404	484	409	403	546	510	416	383
	16,177	18,321	17,057	15,853	14,407	11,788	11,190	9,941

rom 1963 onwards these figures include about 1,000 old age pensioners annually at oncessionary charges.

TABLE LXVIII RADIOACTIVITY

Radioactive Substances Act 1960
Certificates of Registration under Section 1

Date registered	Premises	Radioactive substances	Maximum radioactivity	Date from which use began	Registration revoked w.e.f.
28 Aug 1963	Wiggins Teape Paper Mills	Thallium 204	175 millicuries	1 Dec 1963	19 Sept 1964
18 Sept 1964	Wiggins Teape Paper Mills	Thallium 204 Carbon 14	175 millicuries 500 microcuries	19 Sept 1964	13 June 1967
15 Oct 1963	London Paper Mills	Thallium 204	25 millicuries	1 Dec 1963	21 May 1968
10 Sept 1963	Greaseproof Paper Mills	Thallium 204	25 millicuries	1 Dec 1963	
26 Nov 1963	Wellcome Foundation Biological Control Laboratories	Iodine 131 Phosphorous 32 Sulphur 35	2 millicuries	1 Dec 1963	10 Nov 1965
		Carbon 14 Tritium	10 millicuries		
28 Nov 1963	Baldwin Instrument Company	Not alpha particle emitter	100 curies	1 Dec 1963	18 Feb 1966
28 Nov 1963	Wellcome Foundation Chemical Development Laboratories	Iodine 131	100 microcuries	1 Dec 1963	10 Nov 1965
15 June 1965	College of Technology	Not alpha particle emitter not strontium 90	10 millicuries	17 June 1965	
15 June 1965	College of Technology	Cobalt 60 or Caesium 137 or Radium 226	10 millicuries	17 June 1965	
8 Nov 1965	Wellcome Foundation Chemical Development Laboratories	Iodine 131 or 125	2 millicuries	10 Nov 1965	20 Feb 1970
8 Nov 1965	Wellcome Foundation Biological Control Laboratories	Iodine 125 Iodine 131 Phosphorous 32 Sulphur 35	2 millicuries	10 Nov 1965	11 Dec 1965
		Carbon 14 Tritium	10 millicuries		
9 Dec 1965	Wellcome Foundation Biological Control Laboratories	Neither Strontium 90 nor Alpha particle emitter		11 Dec 1965	
		Carbon 14 Tritium	10 millicuries		
		Others	2 millicuries		
16 Feb 1966	Baldwin Instrument Company Limited	Not alpha particle emitter		18 Feb 1966	21 Feb 1968
		Tritium	250 curies		
		Americium 241	5 curies		
		Others	100 curies		

TABLE LXVIII RADIOACTIVITY (continued)

Radioactive substances Act 1960

Certificates of Registration under Section 1 (continued)

Date registered	Premises	Radioactive substances	Maximum radioactivity	Date from which use began	Registration revoked w.e.f.
13 June 1967	Wiggins Teape Paper Mills	Thallium 204 Carbon 14 Krypton 85	175 millicuries 500 millicuries 650 millicuries	12 June 1967	28 May 1968
21 Feb 1968	Nuclear Enterprises Limited	Tritium Others	5 curies 10 curies	21 Feb 1968	20 Aug 1968
27 May 1968	Wiggins Teape Limited	Thallium 204/or Carbon 14/or Krypton 85	* 8 200) 1 500) milli- 6 690) curies	28 May 1968	
19 Feb 1970	Wellcome Foundation Wellcome Chemical Works	Neither Strontium 90 nor alpha particle emitter Carbon 14) Tritium) Others	 50 millicuries 2 millicuries	20 Feb 1970	

* number of registered sources

TABLE LXXI ATOMIC OR HYDROGEN BOMB TESTS

For reference in interpreting graphs on radioactivity of rain

1958	Test High northern lattitude)	massive weapon tests
1961	" " " ")	
1962	" Pacific and northern lattitudes)	
1963	TEST BAN TREATY. Suspension of weapon tests	
1964	Nuclear device detonated by Chinese, Central Asia	
1966	Three Chinese tests in Central Asia	
1967	Two " " " " "	
1968	Five French tests in the S. Pacific	
1968	One Chinese test in Central Asia	
1969	One " " " " "	
1970	One " " " " "	
1970	One French test in S. Pacific	

TABLE LXIX RADIOACTIVITY (continued)

Radioactive Substances Act 1960
Certificates of Authorisation for the disposal and accumulation of radioactive waste under Section 6

Date registered	Premises	Maximum amounts	Effective date of registration	Registration revoked w.e.f.
26 Nov 1963	Wellcome Foundation Biological Laboratories	By deposit- 2 microcuries/cu.ft By burning- 5 microcuries/day Liquid- 1 millicurie/day	1 Dec 1963	10 Nov 1965
28 Nov 1963	Wellcome Foundation Chemical Development Laboratories	By deposit- 2 microc/131/cu.ft By burning- 5 microc/one week Liquid- 100 microc/month	1 Dec 1963	10 Nov 1965
15 June 1965	College of Technology	Solid- 10 micro/container 1 micro/article Liquid- 500 microc/week	17 June 1965	29 Nov 1965
8 Nov 1965	Wellcome Foundation Chemical Development Laboratories	Solid- 2 microc/cu.ft. Burning- 5 microc/week Liquid- 100 millic/month	10 Nov 1965	19 Aug 1966
8 Nov 1965	Wellcome Foundation Biological Laboratories	Solid- 2 microc/cu.ft. Burning- 5 microc/day Liquid- 1 millic/month	10 Nov 1965	11 Dec 1965
26 Nov 1965	College of Technology	Solid- 2 microc/cu.ft. Liquid- 500 microc/week	29 Nov 1965	
9 Dec 1965	Wellcome Foundation Biological Laboratories	Solid- 2 microc/cu.ft. Burning- 5 microc/day Liquid- 1 millic/month	11 Dec 1965	19 Aug 1966

/continued..

TABLE LXIX RADIOACTIVITY (continued)

Radioactive Substances Act 1960

Certificates of Authorisation for the disposal and accumulation of radioactive waste under S.6 (continued)

Date registered	Premises	Maximum amounts	Effective date of registration	Registration revoked w.e.f.
18 Aug 1966	Wellcome Foundation Wellcome Chemical Works	Iodine 131 Iodine 125 Carbon 14 Solid- 2 microc/cu.ft. Burning- Iodine 125) Iodine 131) 5 microc/week Carbon 14- 100 microc/day Liquid- 1 millic/month	19 Aug 1966	20 Feb 1970
18 Aug 1966	Wellcome Foundation Biological Laboratories	Neither strontium 90 nor alpha particle emitter Solid- 2 microc/cu.ft Liquid- 1 millic/month	19 Aug 1966	20 Feb 1970
19 Feb 1970	Wellcome Foundation The Biological Laboratories	Neither strontium 90 nor alpha particle emitter Solid- 10 microc/0.1 m^3 Burning- 10 microc/week Liquid- 1 millic/month	20 Feb 1970	
19 Feb 1970	Wellcome Foundation Wellcome Chemical Works	Neither strontium 90 nor alpha particle emitter Solid- 10 microc/0.1 m^3 Burning- 10 microc/week Liquid- 1 millic/month	20 Feb. 1970	

LXX

RADIOACTIVITY (continued)

Radioactive waste from major nuclear power stations

Local authorities must be consulted before authorisationsfor the disposal of radioactive waste are granted in respect of major nuclear establishments and joint authorisation is required from both the Minister of the Environment and the Minister of Agriculture,Fisheries and Food.

In 1968 Dartford R.D., Dartford M.B. and Kent C.C. were consulted by the two Ministries and the Secretary of State for Wales on an application from the Central Electricity Generating Board for the disposal of radioactive waste oil by burning it in the oil-fired furnaces of Littlebrook Power Station. Such radioactive waste oil arises from leakage from oil seals in contact with coolant gases of reactors of nuclear power stations. Each such station incurs a waste of about 15000 gallons of such oil a year containing upto 10 curies of tritium and upto 1 curie of other radionuclides.

The proposal was for Littlebrook to burn the contaminated oil from three nuclear power stations one of which might be in Wales. Thus the oil to be burnt would contain upto 30 curies of tritium and upto 3 curies of other radionuclides. The Ministers and the Secretary of State were satisfied that the burning of such oil in such quantities would not cause hazard to public health. Emissions from the stack would contain concentrations well below the maximum recommended by the international commission and at ground level the concentration would be even less. In the ash the concentration would be so low as to require no special precautions. Transport of the oil to the power station by road would involve no special risk in the event of accident. Owing to the dispersal of the flue gases and the ash there would be no build-up of radioactivity.

Check measurements would be made.

Local calculations so far as one's limitations allowed gave conclusions in harmony with the observations of the Ministry.

The 3 curies of radioactive nuclides other than tritium would be from one or more of the following activation products: sulphur 35, calcium 45, chromium 51, manganese 54, iron 55, iron 59, cobalt 60, zinc 65, silver 110m., antimony 124 and mercury 203. There may be some fission product and alpha contamination under abnormal circumstances such as a leaking fuel element in the reactor but activation products would generally predominate.

Authorisation was issued on 26th June 1968.
The conditions for accumulation were that:

(a) the waste is stored in the tanks used for the storage of fuel oil in bulk;
(b) the waste is disposed of as soon as practicable.

The conditions for disposal were that:

(a) the waste is mixed with fuel oil which is not radioactive and burnt therewith in the furnaces;

(b) the waste disposed of does not exceed in one year 30 curies of tritium and 3 curies other radionuclides;

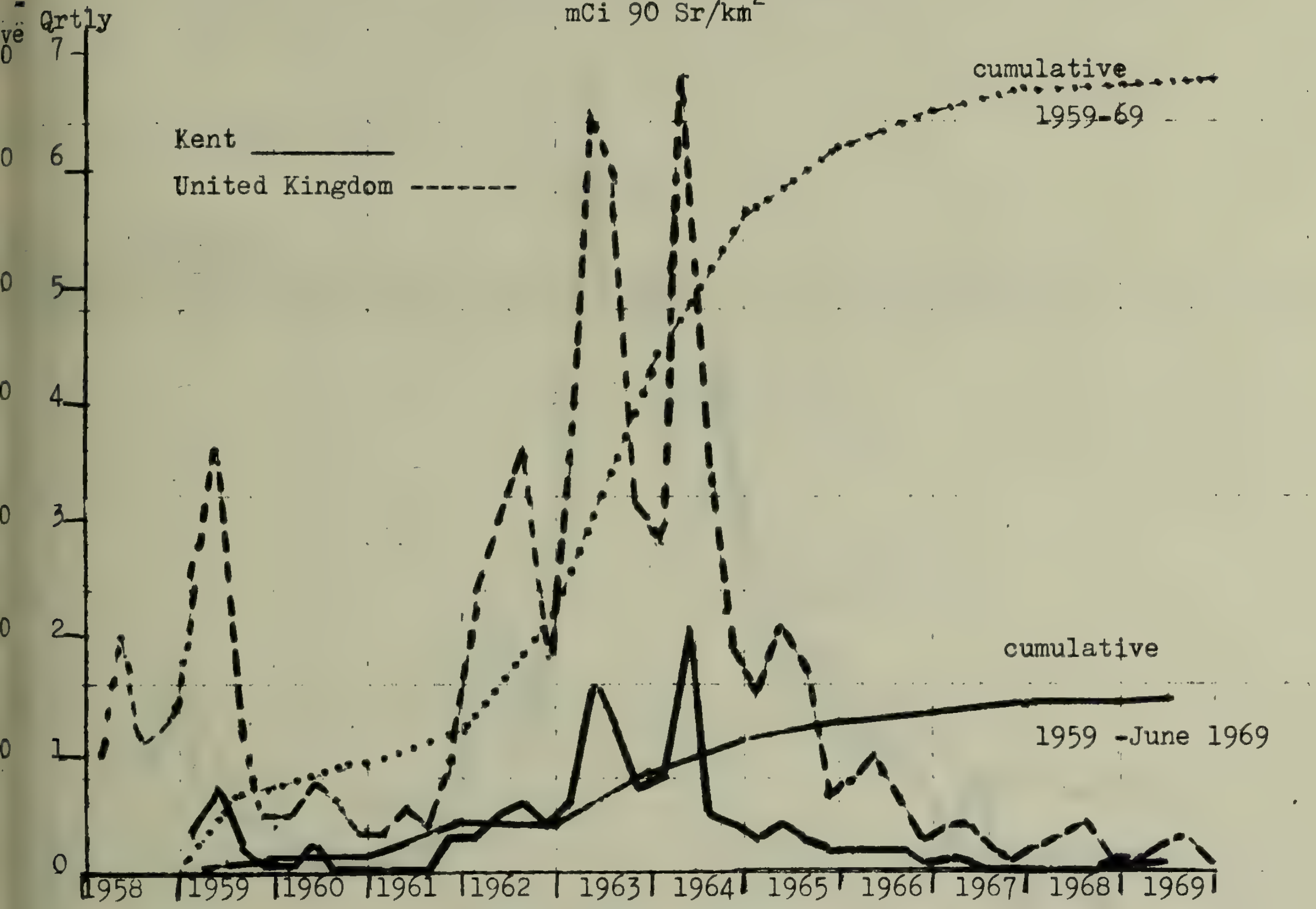
(c) the Board takes samples of the waste and if so directed causes such samples to be examined, retained and the results recorded.

During 1969 the waste oil burnt at Littlebrook Power Station contained only 5.2 millicuries of tritium and 8.8 millicuries of other radionuclides. At certain other power stations burning oil with similar levels of activity measurements had shown that the burning of the contaminated oil had no detectable effect on the environment. Consequently as there was so little activity in the oil burnt at Littlebrook Power Station similar checks on the environment were not considered necessary.

RADIOACTIVITY

RAIN

Strontium 90 deposited by rain
mCi 90 Sr/km^2



1958-69
Quarterly deposition of Sr-90 by rain
mCi 90 Sr/km^2

	Kent	U.K.		Kent	U.K.		Kent	U.K.		Kent	U.K.
1958	?	1.0	1961	0.0	0.3	1964	0.8	2.8	1967	0.1	0.4
	?	2.0		0.0	0.5		2.1	6.8		0.1	0.4
	?	1.1		0.1	0.4		0.5	3.4		0.0	0.2
	?	1.3		0.3	1.0		0.4	1.9		0.0	0.1
1959	0.3	2.4	1962	0.3	2.3	1965	0.3	1.5	1968	0.0	0.2
	0.7	3.6		0.5	3.0		0.4	2.1		0.0	0.3
	0.2	1.2		0.6	3.6		0.3	1.7		0.0	0.4
	0.1	0.5		0.4	1.8		0.2	0.7		0.1	0.1
1960	0.1	0.5	1963	0.6	3.5	1966	0.2	0.8	1969	0.1	0.1
	0.2	0.7		1.6	6.5		0.2	1.0		0.1	0.2
	0.1	0.6		1.2	5.9		0.2	0.6			0.3
	0.1	0.3		0.7	3.1		0.1	0.3			0.1

1959-69
Cumulative deposit of Sr-90 by rain

1959	1.3	7.7.	1962	4.0	22.7	1965	13.1	62.6	1968	14.1	67.4
1960	1.8	9.8	1963	8.1	41.7	1966	13.8	65.3	1969	14.3*	68.1
1961	2.2.	12.0	1964	11.9	56.6	1967	14.0	66.4			

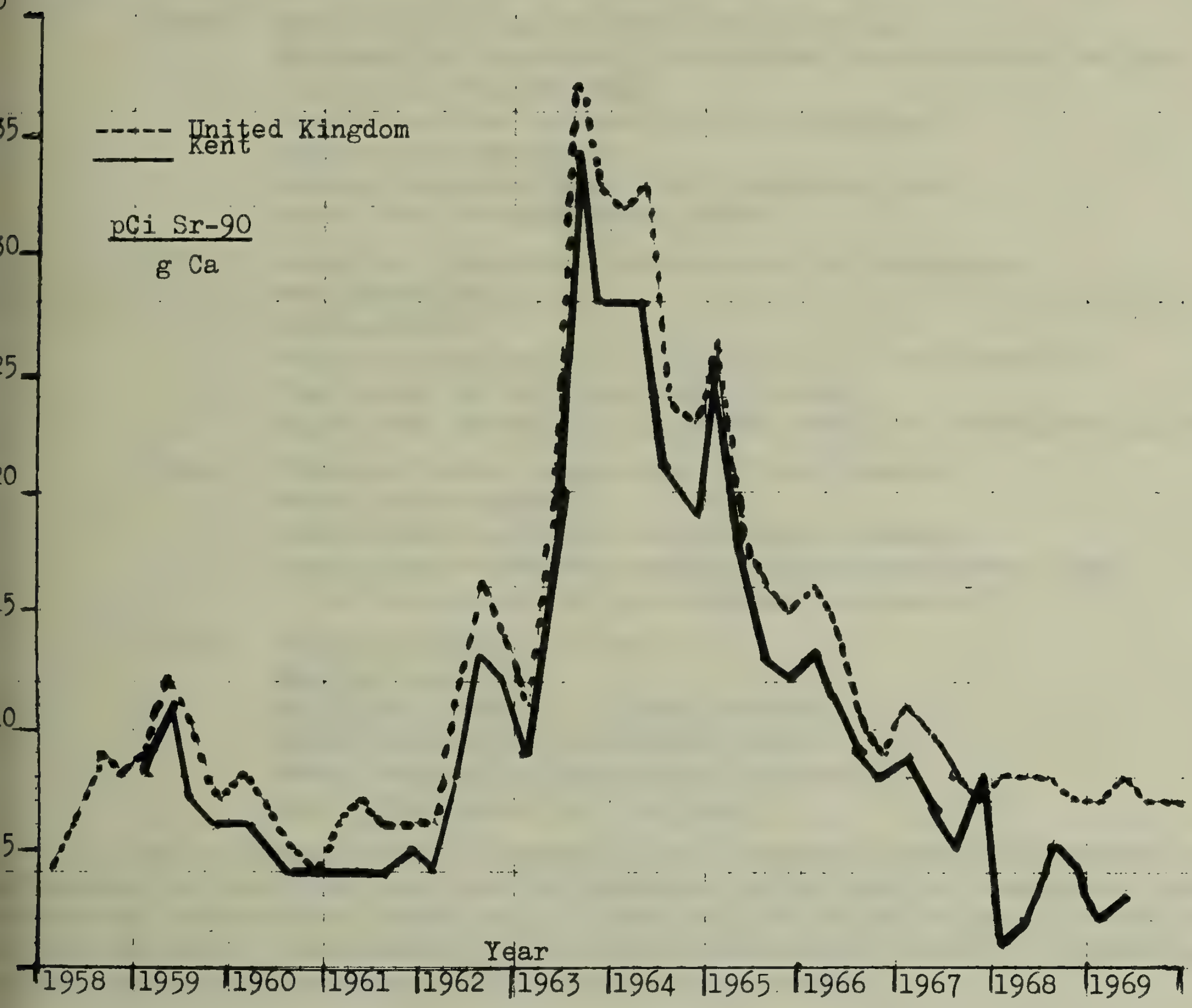
* to June only

Not corrected for radioactive decay

RADIOACTIVITY

MILK

Ratio of Strontium 90 to Calcium



Milk Strontium Units Sr-90 pCi ^{90}Sr/g Ca

	Kent	U.K.		Kent	U.K.		Kent	U.K.		Kent	U.K.
8	?	4	1961	4	6	1964	28	32	1967	9	11
	?	6		4	7		28	33		7	10
	?	9		4	6		21	24		5	8
	?	8		5	6		19	23		8	7
9	8	9	1962	4	6	1965	26	26	1968	1	8
	11	12		8	11		17	19		2	8
	7	10		13	16		13	16		5	8
	6	7		12	14		12	15		4	7
0	6	8	1963	9	11	1966	13	16	1969	2	7
	5	7		20	21		11	14		3	8
	4	5		34	37		9	10		?	7
	4	4		28	33		8	9		?	7

Annual means

8	?	7	1961	4	6	1964	24	28	1967	7	9
9	8	10	1962	9	12	1965	17	19	1968	3	8
0	5	6	1963	23	26	1966	10	12	1969	?	7

Kent measurements from reports of the County Analyst
United Kingdom measurements from reports of the Agricultural Research Council

TABLE LXXII NOISE

Noise nuisances dealt with by the Council's Public Health Inspectors. All were alleviated through obtaining the co-operation of those concerned.

1966 Emission of steam at industrial premises.
Machinery of paper mill, unscreened high velocity fan and defective vacuum pump.
Compressor used in sewer laying operation.
Wood working machinery.
Battery breaking yard - early morning noise.
Night work at engineering works.

1967 Domestic. Structural alterations by neighbours.
Meal break bell.
Barking dogs.
Metal pressing machine. Alleviated by new mountings.
High speed fan of restaurant kitchen.
Night-time charging of ice-cream vehicles' refrigerating units.

1968 "Popular" music propagated by loud speaker.
Motor cycle engines.
Night work in a motor vehicle repair garage.
Heavy goods vehicles leaving early morning from depot, (private action by householders recommended).

1969 Recorded music from boutique.
Barking dog.
Building hovercraft in back garden.
Organ playing at inconvenient time.
Late customers at take away food shop.
Noise from industrial machinery.

In 1967 the Department of Scientific and Industrial Research reported on the efficiency of noise mufflers used on pneumatic drills and air compressors and concluded that substantial reduction of noise could be gained by use of these without significant loss of efficiency. As a result the Council gave every encouragement to contractors to use muffled drills wherever possible.

TABLE LXXIII SMOKE CONTROL

Smoke Control Areas. The work of the Council's Public Health Inspectors has led to the following continuing progress in smoke control.

Cumulative numbers of premises in smoke control areas

	1966	1967	1968	1969
Areas (acres)	1010	1189	1270	2735
Local authority dwellings	3057	3604	3609	3771
Other dwellings	3102	3866	4648	5358
Industrial and commercial premises	64	71	71	127
Other premises	35	42	51	64

Dwellings under smoke control December 1969 ... 9,129
Dwellings in Dartford M.B. at 1st April 1969 ... 14,670

Smoke nuisances dealt with by the Council's Public Health Inspectors were:

	1966	1967	1968	1969
Bonfires	7	5	6	6
Industrial premises	6	10	5	6

Industrial sources of nuisance included: cement works, industrial incinerators, incineration of demolition materials, incinerator at builders yard, grit emission from standby power plant, burning of industrial waste, dark smoke from industrial chimneys and fly ash.

The co-operation of all concerned was obtained. The attention of the Council's Public Health Inspectors led to improvements which included the provision of an after-burner to an incinerator, reconditioning of a grit errestor, and increased height for the chimney of a cold blast cupola.

LXXIV

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
The Volumetric Gauges

The management of the local authority gauges is provided by the Council's ublic Health Inspectors. The nature of the sites of the gauges needs consideration f one is to study the records of the whole area.

wanley I Code B3 is in the public health office which is one of numerous separate ell-spaced buildings in their own grounds on central heating by oil or electricity. edium density housing lies to the North-East round to the South-West. Elsewhere there s open space.

tone (Horns Cross) Code X is in the A.P.C.M. research laboratory which again is in ark land beyond which is medium density housing in the West and North-West ⅔ mile o the North are two cement works.

wanscombe 2 Code B2 is in the precincts of the Swanscombe Council Offices in a small ark amongst medium density housing with open space within ¼ mile to the South and to he North. Cement works lie ⅔ mile to the North and a mile beyond is the River Thames nd its open space.

orthfleet 5 Code X is on the 2nd floor of Northfleet Council Offices. In the mmediate vicinity is residential housing of medium density. Open country begins within mile to the South. Within ½ mile to the North and N.E. is an industrial area with a ement works, paper factory and electricity generating station dominating the environent. To the North beyond is the open space of the River Thames.

artford 6 Code D2 is in the health office in the commercial centre of the town set ack 10 yards from a traffic laden street and with a park in the vicinity to the outh and industry to the North.

Three gauges - Stone (Horns Cross), Swanscombe and Northfleet have cement works n the vicinity. These might be kept in mind as the dust from these works will modify he darkness of the smoke stain and it is possible that it might diminish the acidity rom which the SO_2 readings are assessed.

Class Code (National Survey Site Classification)

In the national survey of which these readings form part each gauge site is given code number as a concise way of classifying the surroundings of each site. The eanings of the codes are as follows:

B2	Residential area with medium density housing, typically in an inner suburb or housing estate, surrounded by other built-up areas but interspersed with some industrial undertakings
B1	Residential area with medium-density housing typically an inner suburb or housing estate, surrounded by other built-up areas.
B3	Residential area with medium-density housing surrounded by or interspersed with areas with low potential A.P. output (park, fields, coast) or any residential area with low-density housing.
C1	Industrial area without domestic premises
C2	Industrial area interspersed with domestic premises of high density or in multiple occupation
D1	Commercial area or one with predominantly central heating
D2	Small town centre, limited commercial area mixed with old residential housing and possibly minor industry.
E	Smoke control area or smokeless zone (the letter to be added to the primary classification).
O1	Open country but not entirely without source(s) of pollution, e.g. airfields.
R	Rural community
X	Unclassified site or mixed area
A2	Residential area with high and medium density housing surrounded by built-up areas interspersed with industrial undertakings.

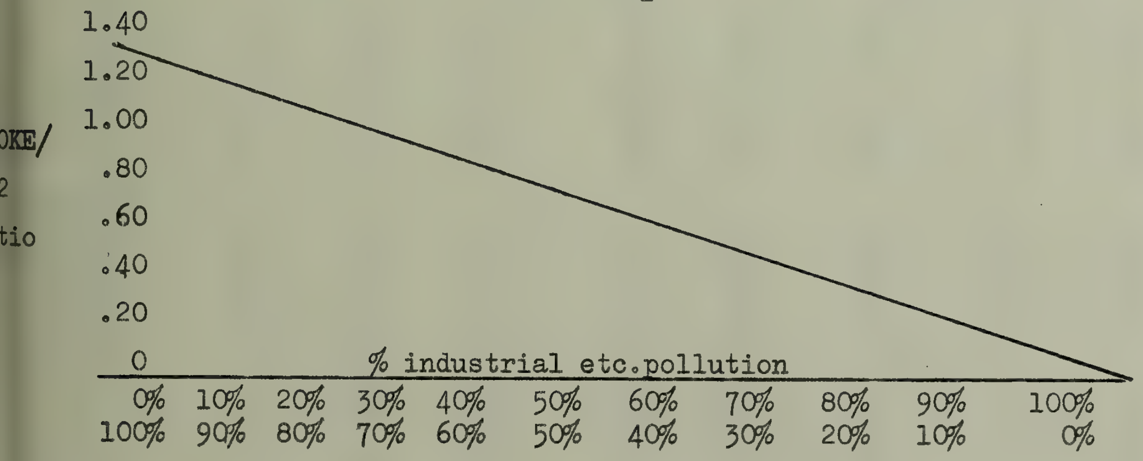
Smoke calculations. These are by use of the British Standard Smoke Calibration Curve.

LXXV

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
INTERPRETATION OF SMOKE/SO_2 RATIOS

In 1965 in England and Wales 0.90 million tons of smoke with 0.70 million tons SO_2 were emitted from domestic coal-fired chimneys. From the chimneys of efficient el combustion i.e. industry and power stations 0.25 million tons of smoke were itted with 5.62 million tons of SO_2 (investigation Atmos.Pull.1956-66 tables 1 and 2). us, the smoke/SO_2 ratios of these emissions were 90/70 = 1.29 and 0.25/5.62 = 0.05 d for the whole country was 0.90 + 0.25/0.70 + 5.62 = 1.15/6.32 = 0.18. An over mplification of the ratios resulting from different proportions of the two sources s:

Domestic Coal burning	Efficient combustion (industry)	Smoke/SO_2 ratio of mixture
100%	0%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 100 + 0.05 \times 0}{1 \times 100 + 1 \times 0} = 1.29$
90%	10%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 90 + 0.05 \times 10}{1 \times 90 + 1 \times 10} = 1.16$
80%	20%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 80 + 0.05 \times 20}{1 \times 80 + 1 \times 20} = 1.04$
70%	30%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 70 + 0.05 \times 30}{1 \times 70 + 1 \times 30} = 0.92$
60%	40%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 60 + 0.05 \times 40}{1 \times 60 + 1 \times 40} = 0.79$
50%	50%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 50 + 0.05 \times 50}{1 \times 50 + 1 \times 50} = 0.67$
40%	60%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 40 + 0.05 \times 60}{1 \times 40 + 1 \times 60} = 0.55$
30%	70%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 30 + 0.05 \times 70}{1 \times 30 + 1 \times 70} = 0.42$
20%	80%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 20 + 0.05 \times 80}{1 \times 20 + 1 \times 80} = 0.30$
10%	90%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 10 + 0.05 \times 90}{1 \times 10 + 1 \times 90} = 0.17$
0%	100%	$\frac{\text{Smoke}}{SO_2} = \frac{1.29 \times 0 + 0.05 \times 100}{1 \times 0 + 1 \times 100} = 0.05$



LXXVI

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
MONTHS OF MINIMUM POLLUTION

microgrammes per cubic metre

Gauge	June			July			August		
and year	Smoke	SO_2	Ratio	Smoke	SO_2	Ratio	Smoke	SO_2	Ratio
SWANLEY									
1963	19	68	.28	20	54	.37	20	39	.51
1964	19	65	.29	21	75	.28	25	75	.33
1965	21	95	.22	15	68	.22	20	88	.23
1966	22	65	.34	19	70	.27	14	68	.21
1967	12	68	.18		N			N	
1968	13	66	.20	15	61	.25	13	61	.21
1969	16	72	.22	27	90	.30	12	63	.19
1970	14	84	.17	12	50	.24	15	60	.25
HORNS CROSS									
1963	15	71	.21	10	61	.16	12	48	.25
1964	16	51	.31	21	70	.30	21	67	.31
1965	15	66	.23	8	45	.18	18	53	.34
1966	19	44	.43	20	30	.67	21	28	.75
1967	15	47	.32	13	53	.25	N	N	N
1968	13	63	.21	13	40	.33	13	31	.42
1969	11	87	.13	20	76	.26	7	68	.10
1970	10	99	.10	10	44	.23	12	71	.17
NORTHFLEET									
1963	17	90	.19	11	58	.19	12	54	.22
1964	17	58	.29	17	17	.15	21	75	.28
1965	16	101	.16	13	61	.21	20	83	.24
1966	20	88	.23	22	74	.30	21	72	.29
1967	16	93	.17	17	75	.23	19	58	.33
1968	18	84	.21	16	68	.24	18	47	.38
1969	23	90	.26	18	64	.28	7	71	.10
1970	16	96	.17	11	45	.24	17	43	.40
SWANSCOMBE									
1963	-	-	-	-	-	-	-	-	-
1964	-	-	-	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-
1966	18	92	.20	19	55	.35	18	77	.23
1967	15	72	.21	13	62	.21	13	42	.31
1968	15	83	.18	15	66	.23	15	57	.26
1969	15	111	.14	28	97	.29	9	98	.09
1970	15	125	.12	11	62	.18	11	66	.17
DARTFORD									
1963	30	108	.28	26	76	.34	29	81	.36
1964	31	88	.35	29	91	.32	36	89	.40
1965	30	104	.29	23	74	.31	40	94	.43
1966	34	94	.36	41	81	.51	36	98	.37
1967	34	111	.31	28	97	.29	34	77	.44
1968	35	109	.32	41	102	.40	44	98	.45
1969	36	95	.38	48	111	.43	22	104	.21
1970	47	122	.39	41	55	.75	47	84	.56

LXXVII

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
MONTHS OF MAXIMUM POLLUTION

microgrammes per cubic metre

Gauge and year	December			January			February		
	Smoke	SO_2	Ratio	Smoke	SO_2	Ratio	Smoke	SO_2	Ratio
SWANLEY									
1963/64		N			N			N	
1964/65	102	208	.49	62	146	.42	65	213	.31
1965/66	51	102	.50	53	150	.35	47	83	.57
1966/67	67	120	.56	82	173	.47	57	123	.46
1967/68	90*	173	.52	66	178	.37	63	132	.48
1968/69	56	135	.41	50*	106	.47	61	181	.34
1969/70	52*	206	.25	31	120	.26	33	142	.23
1970/71	47	129	.36	43*	108	.40	48	137	.35
HORNS CROSS									
1963/64	139	149	.93	133	153	.87	171	165	1.04
1964/65	91	137	.66	54	101	.53	82	151	.54
1965/66	81	78	1.04	83	89	.93	44	54	.81
1966/67	59	73	.94	72	97	.74	47	61	.77
1967/68	66	93	.71	55	125	.44	50	78	.64
1968/69	47	95	.49	40	67	.60	60	161	.37
1969/70	46	106	.43	31	63	.49	28	109	.26
1970/71	39	57	.68	42	85	.49	50	115	.43
NORTHFLEET									
1963/64	167	157	1.06	159	175	.91	194	178	1.09
1964/65	101	198	.51	68	138	.49	87	185	.47
1965/66	93	165	.56	114	165	.69	53	101	.52
1966/67	67	142	.47	89	168	.53	58	110	.53
1967/68	87	171	.51	74	191	.39	59	105	.56
1968/69	72	113	.64	59	130	.45	83	205	.40
1969/70	62	73	.85	N	N	N	34	57	.60
1970/71	60	96	.63	48	77	.62	47	86	.55
SWANSCOMBE									
1963/64	-	-	-	-	-	-	-	-	-
1964/65	-	-	-	-	-	-	-	-	-
1965/66	94	96	.98	104	115	.90	49	63	.78
1966/67		N		85	146	.58	-	-	-
1967/68	89*	136	.65	75	159	.47	74	98	.76
1968/69	N	N	N	65	85	.76	72	190	.38
1969/70	66*	160	.41	53	95	.56	46	130	.35
1970/71	55	84	.65	47	94	.50	42	129	.33
DARTFORD									
1963/64	214	268	.80	197	282	.70	199	262	.76
1964/65	130	259	.50	91	203	.45	103	293	.33
1965/66	117	186	.63	132	226	.58	69	121	.57
1966/67	94	183	.51	116	238	.49	74	152	.49
1967/68	106	265	.40	91	304	.30	111	204	.54
1968/69	106	184	.58	81	166	.49	103	264	.39
1969/70	99	214	.46	77	139	.55	61	175	.35
1970/71	97	177	.55	75	161	.47	75	176	.43

* estimated from reflectometer of less than 40

LXXVIII

AIR POLLUTION WITH PRODUCTS OF COMBUSTION
NUMBER OF DAYS WHEN READINGS EXCEEDED 500 MICROGRAMMES PER CUBIC METRE

Highest daily readings given with month

Code	Gauge site	Winter	Smoke			Sulphur-dioxide		
B3	SWANLEY 1	1963/4	3	619	(Dec)	4	786	(Jan)
		1964/5	0	0		3	730	(Dec)
		1965/7	0			0		
		1967/8	0			1	603	(Dec)
		1968/9	0			2	604	(Feb)
		1969/70	0			2	773	(Dec)
X	HORNS CROSS (STONE)1	1963/4	2	873	(Nov)	0		
		1964/70	0			0		
B2	SWANSCOMBE 2	1966/67	0			0		
		1967/8	0			1	554	(Jan)
		1968/70	0			0		
X	NORTHFLEET 5	1963/4	3	534	(Feb)	4	542	(Feb)
		1964/5	0			0		
		1965/6	0			1	562	(Dec)
		1966/7	0			1	556	(Jan)
		1967/8	0			0		
		1968/9	0			1	549	(Feb)
		1969/70	0			0		
D2	DARTFORD 6	1963/4	5	837	(Feb)	11	785	(Jan)
		1964/5	0			8	1106	(Nov)
		1965/6	0			1	533	(Nov)
		1966/7	0			4	542	(Jan)
		1967/8	0			4	1069	(Jan)
		1968/9	0			2	575	(Jan)
						2	632	(Feb)
		1969/70	0			1	644	(Dec)

DEGREE DAYS

	Av.1950-70	1962-3	1963-4	1964-5	1965-6	1966-7	1967-8	1968-9	1969-70
Sept	140	202	169	143	186	129	124	101	104
Oct	291	312	308	393	272	243	224	169	207
Nov	501	560	423	425	565	515	535	474	508
Dec	647	793	796	652	590	560	633	724	687
Jan	701	1031	765	653	740	619	646	541	639
Feb	631	859	625	623	447	507	675	705	601
Mar	558	556	657	550	497	436	488	624	655
Oct-Mar	3329	4111	3574	3296	3111	2880	3201	3237	3297
April	413	410	411	383	398	434	408	418	478
May	253	310	172	233	260	261	310	245	187
Sept-May	4135	5033	4326	4055	3955	3704	4043	4001	4066
June	125	124	142	130	75	125	108	142	80
July	75	104	55	96	87	55	82	57	74
August	83	118	81	90	113	79	54	62	70
June-Aug	283	346	278	316	275	259	244	261	224

Degree day: each 1°F below 60°F maintained for 24 hours. Source Gas Council

LXXX

SMOKE THAMES-SIDE WINTER

Code	Site	1962-63	63-64	64-65	65-66	66-67	67-68	68-69	69-70
		microgrammes per cubic metre							
B1	Bexleyheath 1	N	156	115	83	75	66	66	52
C2	Erith 1	92	76	N	-	-	-	-	-
A2	Erith 3	184	168	N	N	84	75	68	55
C1	Erith 4	-	-	N	56	46	N	39	51
D2	Crayford 2	101	141	65	83	77	73	76	52
B3	Sidcup 3	123	120	89	71	59	50	48	33
B3	Swanley 1	116	114	74	53	60	N	50	33
D2	Dartford 6	146	144	103	94	89	87	89	62
X	Stone I Horns Cross	102	102	N	63	52	46	43	31
B2	Swanscombe 2	-	-	-	N	N	63	61	47
X	Northfleet 5	119	118	82	76	63	58	64	N
B3/E	Thurrock 6	105	86	80	67	64	58	52	39
B1	Thurrock 7	141	139	131	113	92	94	89	87
D2	Thurrock 9	-	-	119	99	87	79	N	47
B2	Tilbury/Thurrock 26	-	-	-	-	N	N	62	57
B3	Tilbury/Thurrock 29	-	-	-	-	N	36	31	29
01	Tilbury/Thurrock 30	-	-	-	-	N	N	34	32
01	Tilbury/Thurrock 31	-	-	-	-	N	N	35	33
B3	Tilbury/Thurrock 32	-	-	-	-	N	54	44	N
R	Tilbury/Thurrock 33	-	-	-	-	N	32	N	N
R	Tilbury/Thurrock 34	-	-	-	-	N	26	N	N
D1	Gravesend 22	177	179	121	N	N	-	-	-
D1	Gravesend 23	-	-	-	-	-	-	45	N
B3	Strood 2	123	119	99	77	73	64	65	52
R	Kingsnorth 1	-	-	-	-	-	-	N	21
X	Kingsnorth 3	-	-	-	-	N	34	N	38
01	Kingsnorth 4	-	-	-	-	N	N	N	30
01	Kingsnorth 5	-	-	-	-	N	29	N	27
B3	Kingsnorth 7	-	-	-	-	N	31	N	N
X	Kingsnorth 8	-	-	-	-	N	42	N	36
B3	Kingsnorth 9	-	-	-	-	N	33	N	28
01	Kingsnorth 10	-	-	-	-	N	34	N	31
B3	Kingsnorth 11	-	-	-	-	N	38	N	34
R	Kingsnorth 12	-	-	-	-	N	44	N	N
A1	Rochester 4	133	N	99	90	65	64	67	44
X	Chatham 3	N	134	88	84	64	57	53	51

Source National Survey

LXXXI

SULPHUR DIOXIDE THAMES-SIDE WINTER

Code	Site	1962-3	63-64	64-65	65-66	66-67	67-68	68-69	69-70
				microgrammes per cubic metre					
B1	Bexleyheath 1	N	198	212	177	94	179	155	139
C2	Erith 1	185	60	N	-	-	-	-	-
A2	Erith 3	280	217	N	N	202	214	157	157
C1	Erith 4	-	-	N	114	137	N	160	184
D2	Crayford 2	293	209	177	166	141	177	184	132
B3	Sidcup 3	216	185	195	163	123	133	133	110
B3	Swanley 1	182	141	169	124	120	N	123	135
D2	Dartford 6	256	N	225	181	173	202	173	150
X	Stone I Horns Cross	143	110	N	84	67	75	96	83
B2	Swanscombe 2	-	-	-	N	N	108	108	111
X	Northfleet 5	190	125	164	152	127	126	130	N
B3/E	Thurrock 6	198	159	169	129	138	124	101	134
B1	Thurrock 7	192	150	168	141	167	138	119	140
D2	Thurrock 9	-	-	169	118	141	135	N	129
B2	Tilbury/Thurrock 26	-	-	-	-	N	N	131	128
B3	Tilbury/Thurrock 29	-	-	-	-	N	116	76	81
01	Tilbury/Thurrock 30	-	-	-	-	N	N	93	100
01	Tilbury/Thurrock 31	-	-	-	-	N	N	82	89
B3	Tilbury/Thurrock 32	-	-	-	-	N	195	124	N
R	Tilbury/Thurrock 33	-	-	-	-	N	134	N	N
R	Tilbury/Thurrock 34	-	-	-	-	N	96	N	N
D1	Gravesend 22	190	163	154	121	N	-	-	-
D1	Gravesend 23	-	-	-	-	-	-	112	100
B3	Strood 2	155	131	143	111	107	134	116	126
R	Kingsnorth 1	-	-	-	-	-	-	N	88
X	Kingsnorth 3	-	-	-	-	N	98	N	97
01	Kingsnorth 4	-	-	-	-	N	N	N	80
01	Kingsnorth 5	-	-	-	-	N	76	N	69
B3	Kingsnorth 7	-	-	-	-	N	104	N	N
X	Kingsnorth 8	-	-	-	-	N	118	N	97
B3	Kingsnorth 9	-	-	-	-	N	118	N	117
01	Kingsnorth 10	-	-	-	-	N	86	N	81
B3	Kingsnorth 11	-	-	-	-	N	98	N	84
R	Kingsnorth 12	-	-	-	-	N	103	N	N
A1	Rochester 4	158	N	121	109	107	99	90	82
X	Chatham 3	N	130	144	134	109	112	155	97

LXXXII

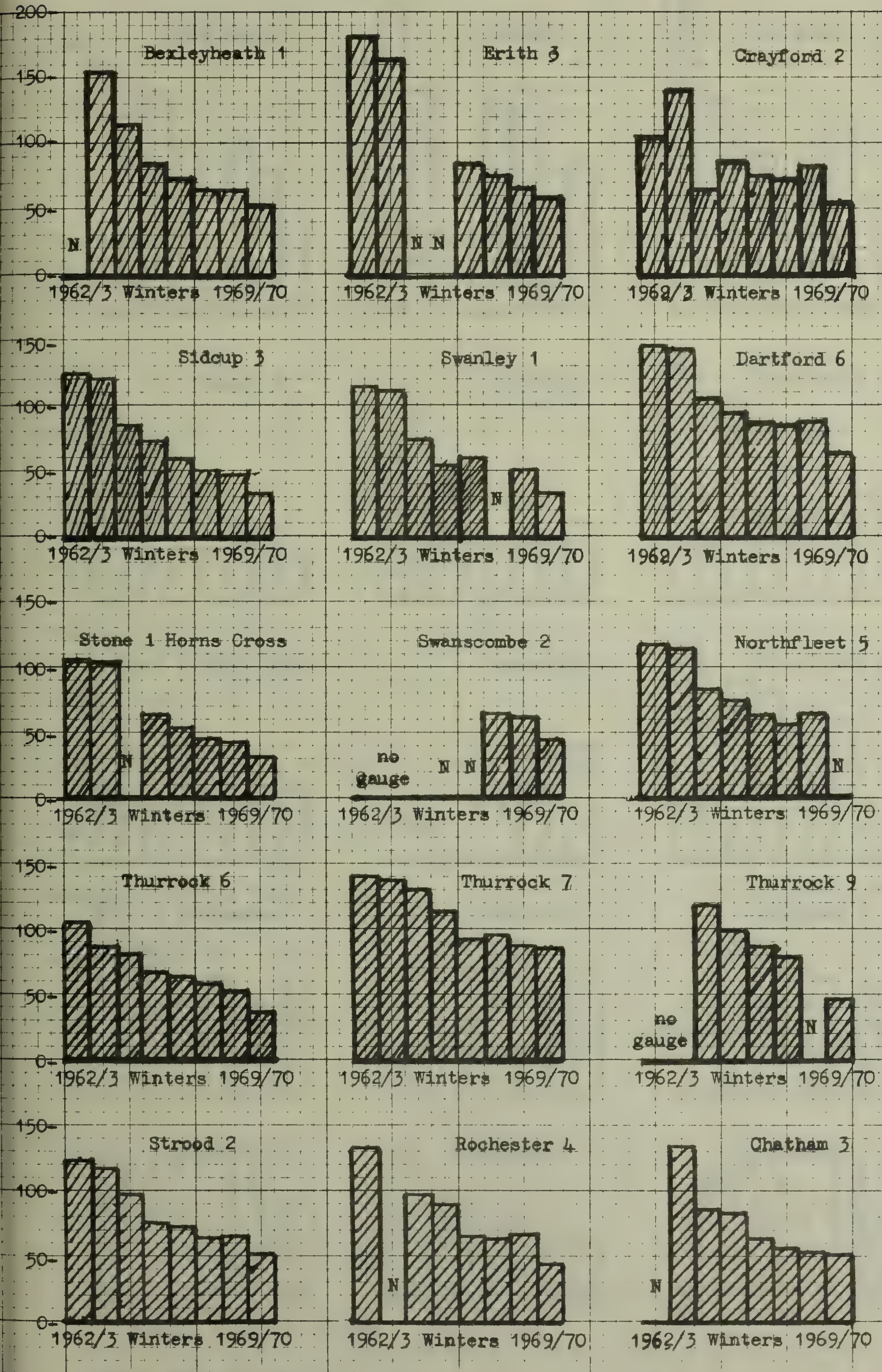
SMOKE/SO_2 RATIO THAMES-SIDE WINTER

microgrammes per cubic metre

Code	Site	1962-3	63-64	64-65	65-66	66-67	67-68	68-69	69-70
B1	Bexleyheath 1	N	.79	.54	.47	.80	.37	.43	.37
C2	Erith 1	.50	1.27	N	-	-	-	-	-
A2	Erith 3	.66	.77	N	N	.42	.35	.43	.35
C1	Erith 4	-	-	N	.49	.34	N	.24	.28
D2	Crayford 2	.34	.67	.37	.50	.55	.41	.41	.39
B3	Sidcup 3	.57	.65	.46	.44	.48	.38	.36	.30
B3	Swanley 1	.64	.81	.44	.43	.50	N	.41	.24
D2	Dartford 6	.57	N	.46	.52	.51	.43	.51	.41
X	Stone I Horns Cross	.71	.93	N	.75	.78	.61	.45	.37
B2	Swanscombe 2	-	-	-	N	N	.58	.56	.42
X	Northfleet 5	.63	.94	.50	.50	.50	.46	.49	N
B3/E	Thurrock 6	.53	.54	.47	.52	.46	.47	.51	.29
B1	Thurrock 7	.73	.93	.78	.80	.55	.68	.75	.62
D2	Thurrock 9	-	-	.70	.84	.62	.59	N	.36
B2	Tilbury/Thurrock 26	-	-	-	-	N	N	.47	.45
B3	Tilbury/Thurrock 29	-	-	-	-	N	.31	.41	.36
01	Tilbury/Thurrock 30	-	-	-	-	N	N	.37	.32
01	Tilbury/Thurrock 31	-	-	-	-	N	N	.43	.37
B3	Tilbury/Thurrock 32	-	-	-	-	N	.28	.35	N
R	Tilbury/Thurrock 33	-	-	-	-	N	.24	N	N
R	Tilbury/Thurrock 34	-	-	-	-	N	.27	N	N
D1	Gravesend 22	.93	1.10	.79	N	N	-	-	-
D1	Gravesend 23	-	-	-	-	-	-	.40	N
B3	Strood 2	.79	.91	.68	.69	.68	.48	.56	.41
R	Kingsnorth 1	-	-	-	-	-	-	N	.24
X	Kingsnorth 3	-	-	-	-	N	.35	N	.39
01	Kingsnorth 4	-	-	-	-	N	N	N	.38
01	Kingsnorth 5	-	-	-	-	N	.38	N	.39
B3	Kingsnorth 7	-	-	-	-	N	.30	N	N
X	Kingsnorth 8	-	-	-	-	N	.35	N	.37
B3	Kingsnorth 9	-	-	-	-	N	.28	N	.24
01	Kingsnorth 10	-	-	-	-	N	.40	N	.38
B3	Kingsnorth 11	-	-	-	-	N	.39	N	.40
R	Kingsnorth 12	-	-	-	-	N	.43	N	N
A1	Rochester 4	.84	N	.82	.83	.61	.65	.74	.54
X	Chatham 3	N	1.03	.61	.62	.59	.51	.34	.53

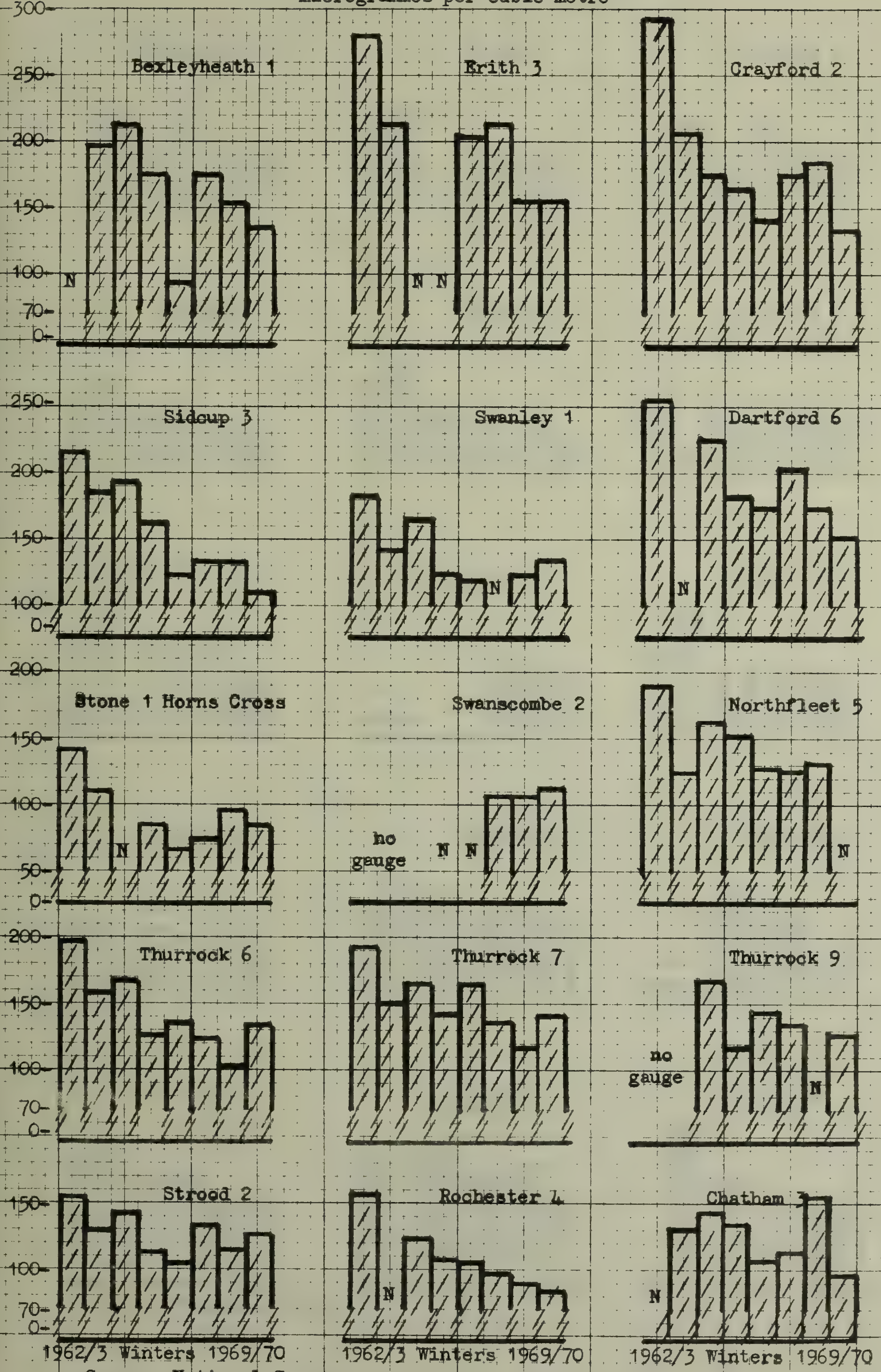
SMOKE THAMES-SIDE WINTER

microgrammes per cubic metre



Source National Survey

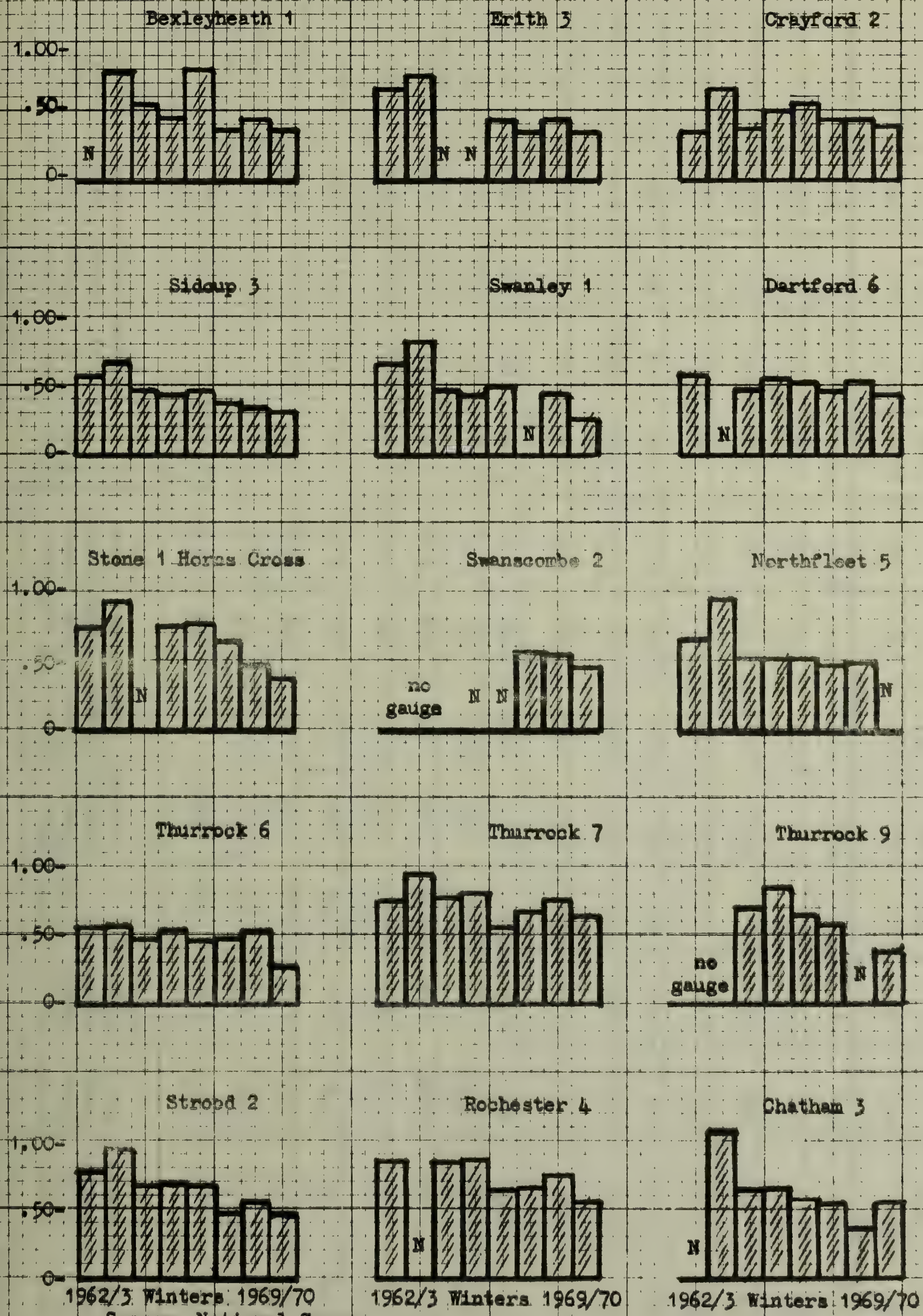
SULPHUR DIOXIDE THAMES-SIDE WINTER
micrograms per cubic metre



Source National Survey

SMOKE/SO_2 RATIO THAMES-SIDE WINTER

microgrammes per cubic metre



Source : National Survey

LXXXIII

	DARTFORD CENTRAL					DARTFORD BOW ARROW					DARTFORD JOYCE GREEN				
Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust
1954-55	299	218	81	27%	0.37	283	196	87	31%	0.44					
1955-56	352	235	117	33%	0.50	400	209	191	48%	0.91					
1956-57	[e] 305	216	89	29%	0.41	294	172	122	42%	0.71	368	270	98	27%	0.36
1957-58	297	209	88	30%	0.42	374	209	165	44%	0.79	360	255	105	29%	0.41
1958-59	273	175	98	36%	0.56	353	174	179	51%	1.03	396	245	151	38%	0.62
1959-60	303	157	146	46%	0.82	451	180	271	60%	1.51	339	179	160	47%	0.89
1960-61	273	143	130	48%	0.91	385	132	253	66%	1.92	384	222	162	42%	0.73
1961-62	313	145	168	54%	1.16	[c] 406	109	297	73%	2.72	[a] 363	160	[a] 203	56%	1.27
1962-63	288	125	163	57%	1.30	[c] 411	106	305	74%	2.88	[h] 259	164	95	37%	0.58
1963-64	263	140	123	47%	0.88	375	166	209	56%	1.26	[a] 343	188	[a] 155	45%	0.32
1964-65	248	175	73	29%	0.42	345	220	125	36%	0.57	262	174	88	34%	0.51
1965-66	228	160	68	30%	0.43	337	220	117	35%	0.53	278	205	73	26%	0.36
1966-67	264	179	85	32%	0.47	[c] 421	286	135	32%	0.48	[d] 331	265	[d] 56	17%	0.21
1967-68	260	180	80	31%	0.44	[c] 333	202	131	39%	0.64	[a] 293	204	[a] 88	30%	0.44
1968-69	[b] 297	171	126	42%	0.74	[a] 411	201	210	51%	1.04	[b] 347	248	[b] 99	29%	0.50
Total	4263	2648	1635	38%	0.62	5579	2782	2797	50%	1.00	4313	2779	1534	36%	0.54
Yearly Mean	284	177	108			372	185	187			332	214	117		

LXXXIV

	HORNS CROSS					SWANSCOMBE					NORTHFLEET				
Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust
1954-55	620	204	416	67%	2.04	554	235	319	58%	1.36	448	190	258	58%	1.36
1955-56	685	251	434	63%	1.73	607	250	357	59%	1.43	545	220	325	60%	1.48
1956-57	578	172	406	70%	2.37	470	183	287	61%	1.57	428	161	267	63%	1.66
1957-58	643	223	420	65%	1.88	602	275	327	54%	1.19	517	236	281	54%	1.19
1958-59	573	184	389	68%	2.11	587	264	323	55%	1.22	597	325	272	46%	0.84
1959-60	678	186	492	73%	2.65	603	209	394	65%	1.83	658	224	434	66%	1.93
1960-61	c 576	129	447	77%	3.47	a 508	123	385	76%	3.13	448	116	332	74%	2.86
1961-62	720	116	604	84%	5.20	c 494	102	392	79%	3.84	450	107	343	76%	3.20
1962-63	c 729	145	584	80%	4.04	c 456	75	381	83%	5.08	433	72	361	84%	5.00
1963-64	562	103	459	82%	4.46	470	124	346	74%	2.79	432	132	300	69%	2.27
1964-65	588	130	458	78%	3.53	493	182	311	63%	1.71	407	169	238	58%	1.41
1965-66	d 610	264	346	57%	1.31	505	211	294	58%	1.39	418	196	222	53%	1.13
1966-67	a 618	259	359	58%	1.37	490	174	316	65%	1.83	c 445	221	224	50%	0.99
1967-68	590	210	380	65%	1.81	444	172	272	61%	1.59	N	N	N		
1968-69	a 735	274	461	63%	1.70	e 486	204	282	58%	1.38	N	N	N		
Total	9505	2850	6655	70%	2.34	7769	2783	4986	65%	1.78	6226	2369	3857	62%	1.63
Yearly Mean	634	190	444			517	186	333			479	183	298		

LXXXV

Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	'Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust
1954-55											1622	629	993	61%	1.58
1955-56											1837	721	1116	61%	1.55
1956 57	912	740	172	19%	0.23	967	658	309	32%	0.47	1476	516	960	65%	1.86
1957-58	934	795	139	15%	0.18	1031	673	358	35%	0.53	1762	734	1028	58%	1.40
1958-59	920	716	204	22%	0.28	1022	594	428	42%	0.72	1757	773	984	56%	1.28
1959-60	1026	738	288	28%	0.39	1093	516	577	53%	1.13	1939	619	1320	68%	2.14
1960-61	929	695	234	25%	0.34	1042	497	545	52%	1.09	1532	368	1164	76%	3.18
1961-62	1019	726	293	29%	0.40	1082	414	668	62%	1.63	1664	325	1339	80%	4.12
1962-63	1033	722	311	30%	0.43	958	395	563	59%	1.43	1618	292	1326	82%	4.56
1963-64	888	673	215	24%	0.32	981	494	487	50%	0.99	1464	359	1105	75%	3.08
1964-65	856	747	109	13%	0.15	855	569	286	33%	0.50	1488	481	1007	67%	2.09
1965-66	917	784	133	15%	0.17	843	585	258	31%	0.44	1533	671	862	56%	1.28
1966-67	925	835	90	10%	0.11	1016	740	276	27%	0.37	1553	654	899	58%	1.37
1967-68	895	763	132	15%	0.17	886	586	300	34%	0.51		No gauge at Northfleet			
1968-69	1022	770	252	25%	0.33	1055	620	435	41%	0.70					
Total	12276	9704	2572	21%	0.27	12831	7361	5470	42%	0.72	21245	7142	14103	67%	1.98
Yearly Mean	944	746	198			987	566	421			1638	548	1085		

	GRAVESEND DASHWOOD					GRAVESEND SWIMMING BATHS					GRAVESEND GAUGES COMBINED				
Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio cement works/ other dust
1954-55															
1955-56															
1956-57	211	144	67	32%	0.47	202	138	64	32%	0.46	413	282	131	32%	0.47
1957-58	239	190	49	20%	0.26	239	183	56	23%	0.31	478	373	105	22%	0.28
1958-59	241	179	62	25%	0.35	233	169	64	27%	0.38	474	348	126	27%	0.36
1959-60	187	124	63	34%	0.51	219	151	68	31%	0.45	406	275	131	32%	0.48
1960-61	206	133	73	35%	0.55	227	157	70	31%	0.45	433	290	143	33%	0.49
1961-62	201	125	76	37%	0.61	214	145	69	32%	0.48	415	270	145	35%	0.54
1962-63	193	128	65	34%	0.51	[c] 195	135	60	30%	0.44	388	263	125	32%	0.48
1963-64	199	144	55	28%	0.38	221	162	59	27%	0.36	420	306	114	27%	0.37
1964-65	207	164	43	21%	0.26	214	165	49	23%	0.30	421	329	92	22%	0.28
1965-66	188	148	40	21%	0.27	210	166	44	21%	0.27	398	314	84	21%	0.27
1966-67	250	211	39	16%	0.19	226	196	30	13%	0.15	476	407	69	14%	0.17
1967-68	[b] 195	158	37	19%	0.23	208	181	27	13%	0.15	403	339	64	15%	0.18
1968-69	[a] 277	242	35	13%	0.15	[a] 204	169	35	17%	0.20	481	411	70	14%	0.15
Total	2794	2090	704	26%	0.35	2812	2117	695	25%	0.32	5606	4207	1399	25%	0.33
Yearly Mean	215	161	54			216	163	53			431	323	107		

LXXXVII

DEPOSIT GAUGE READINGS

LONDON FRINGE GROUP excl. SWANLEY - DARTFORD GROUP excl.SOUTHERN HOSPITAL- HORNS CROSS, SWANSCOMBE,NORTHFLEET,GRAVESEND

13 GAUGES COMBINED

Year ending March	Total dust	Dust from other sources	Dust from cement works	% dust from cement works	Ratio: cement works/ other dust	Ratio: other dust/ dust from cement wks	% dust from other sources
1956-57	3768	2196	1572	42%	0.72	1.39	58%
1957-58	4205	2575	1630	39%	0.63	1.58	61%
1958-59	4173	2431	1742	42%	0.72	1.39	58%
1959-60	4464	2148	2316	52%	1.08	0.93	48%
1960-61	3936	1850	2086	53%	1.13	0.89	47%
1961-62	4180	1735	2445	59%	1.41	0.71	41%
1962-63	3997	1672	2325	58%	1.39	0.72	42%
1963-64	3753	1832	1921	51%	1.05	0.95	49%
1964-65	3620	2126	1494	41%	0.70	1.43	59%
1965-66	3691	2354	1337	36%	0.57	1.76	64%
1966-67	3970	2636	1334	34%	0.51	1.97	66%
1956-67	43757	23565	20202	46%	0.86	1.17	54%

In the foregoing tables:

The individual gauge readings for each year are given as tons per sq.mile.

To convert to milligrams per sq metre per day, multiply the amount of deposits by - $\frac{13}{12}$

Key to abbreviations in tables:

a Total of 6 winter months and a summer figure for 6 months estimated from 5

b Ditto " " 4

c Total of 6 summer months and a winter figure for 6 months estimated from 5

d Ditto " " 4

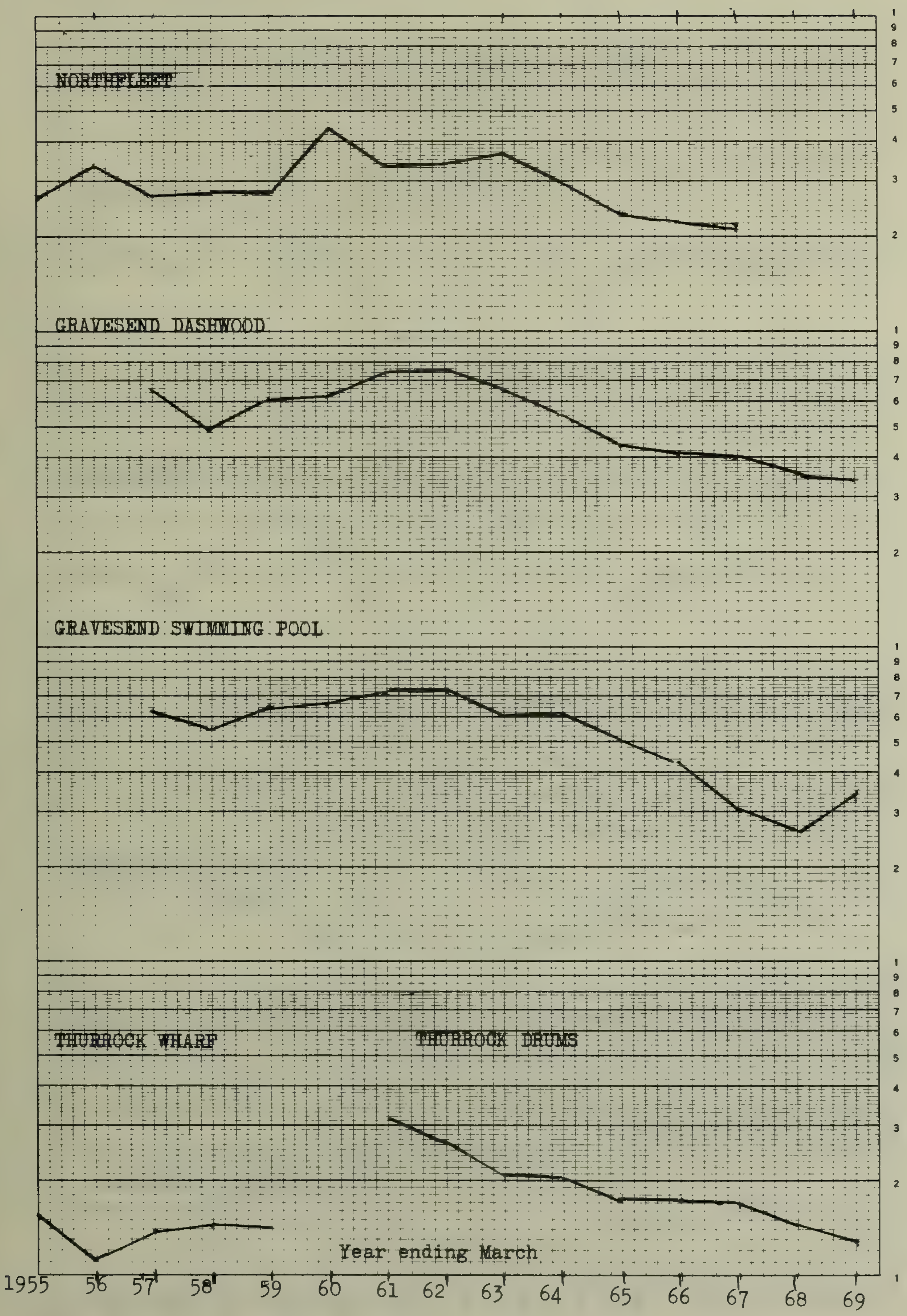
e A winter figure for 6 months estimated from 5 and a summer figure for 6 months estimated from 5

f A winter figure for 6 months estimated from 4 and a summer figure for 6 months estimated from 5

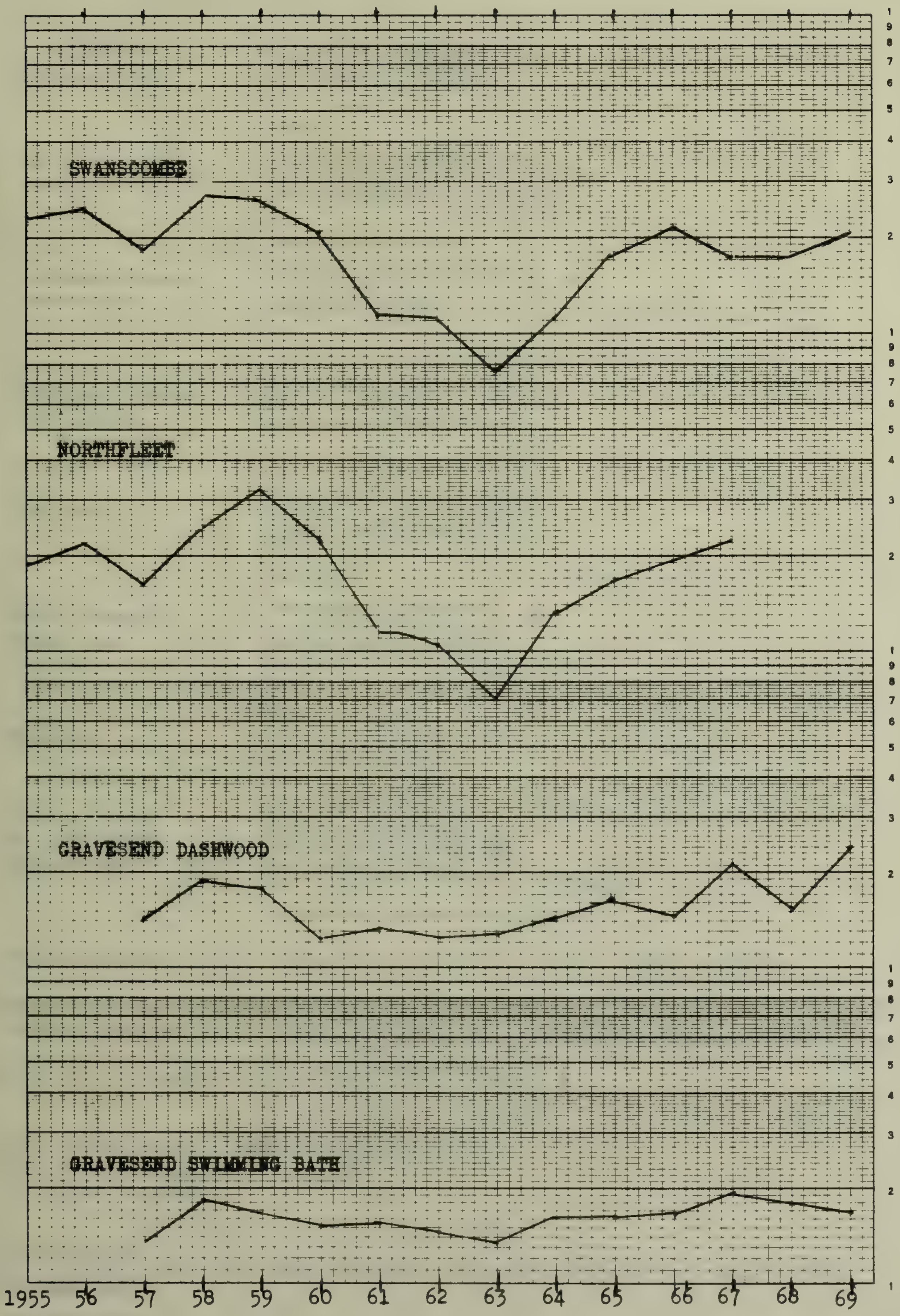
g A winter figure for 6 months estimated from 5 and a summer figure for 6 months estimated from 4

h Contains an estimate for a half year based on 3 monthly readings.

DUST FROM CEMENT WORKS

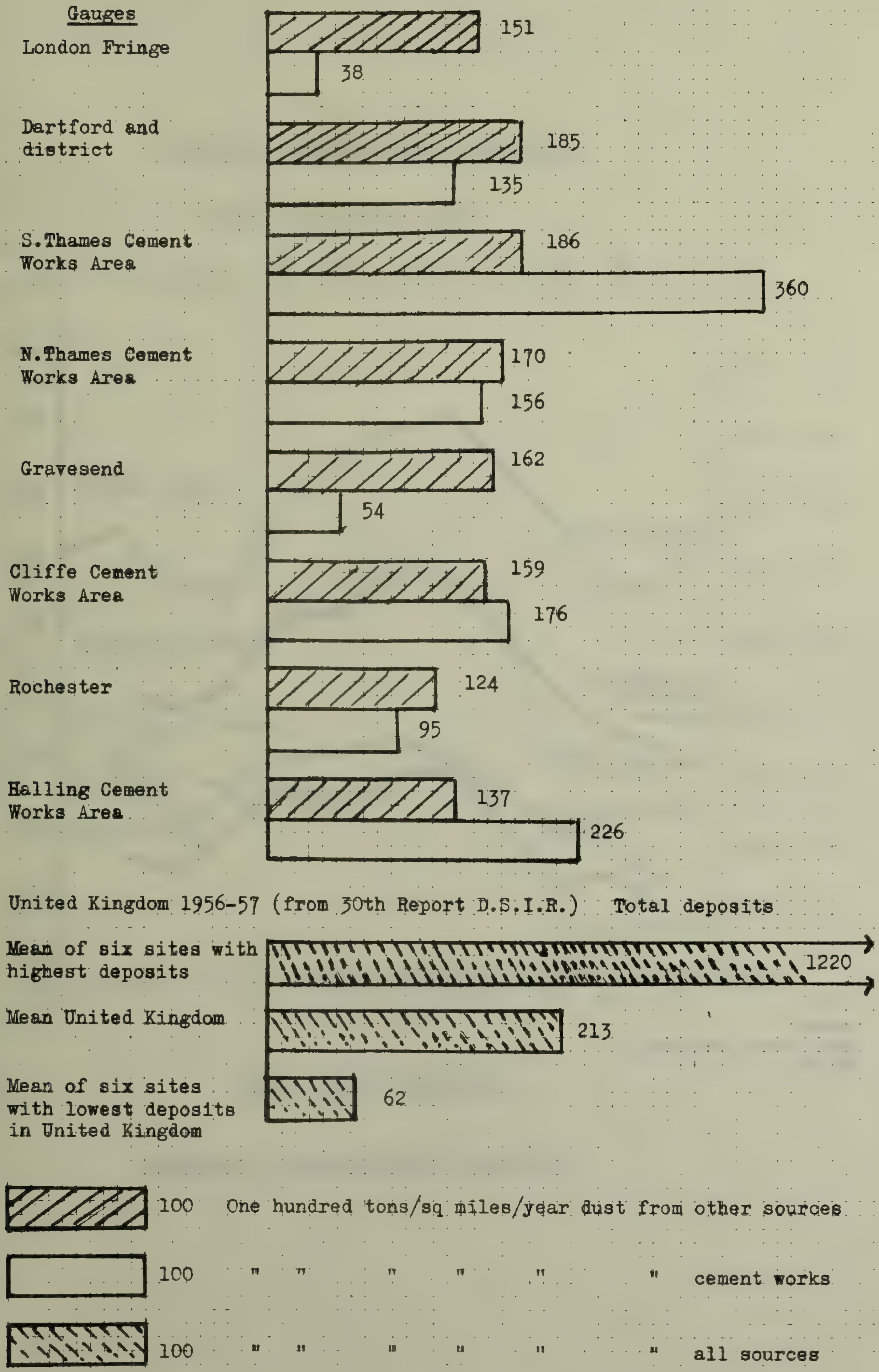


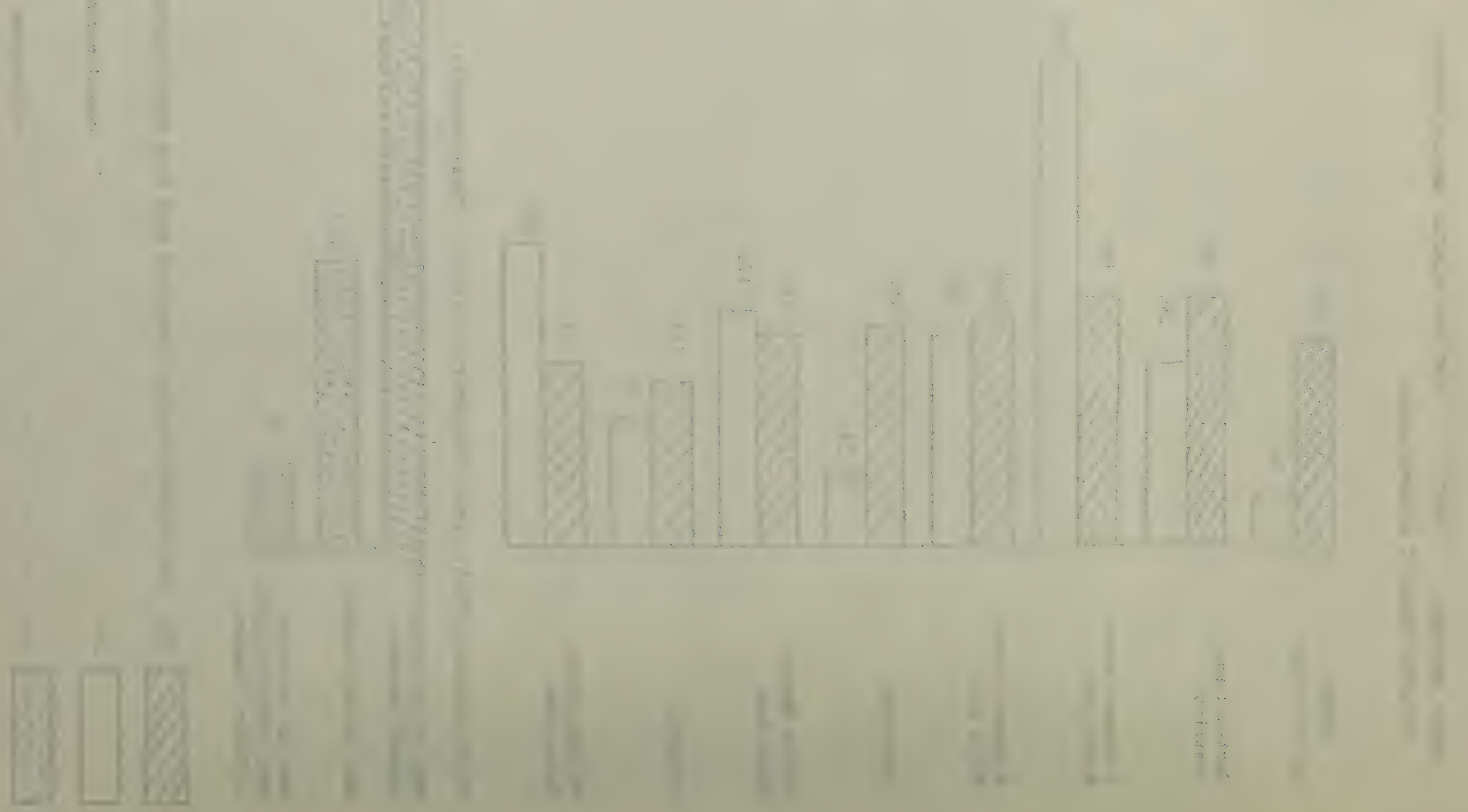
DUST FROM OTHER SOURCES



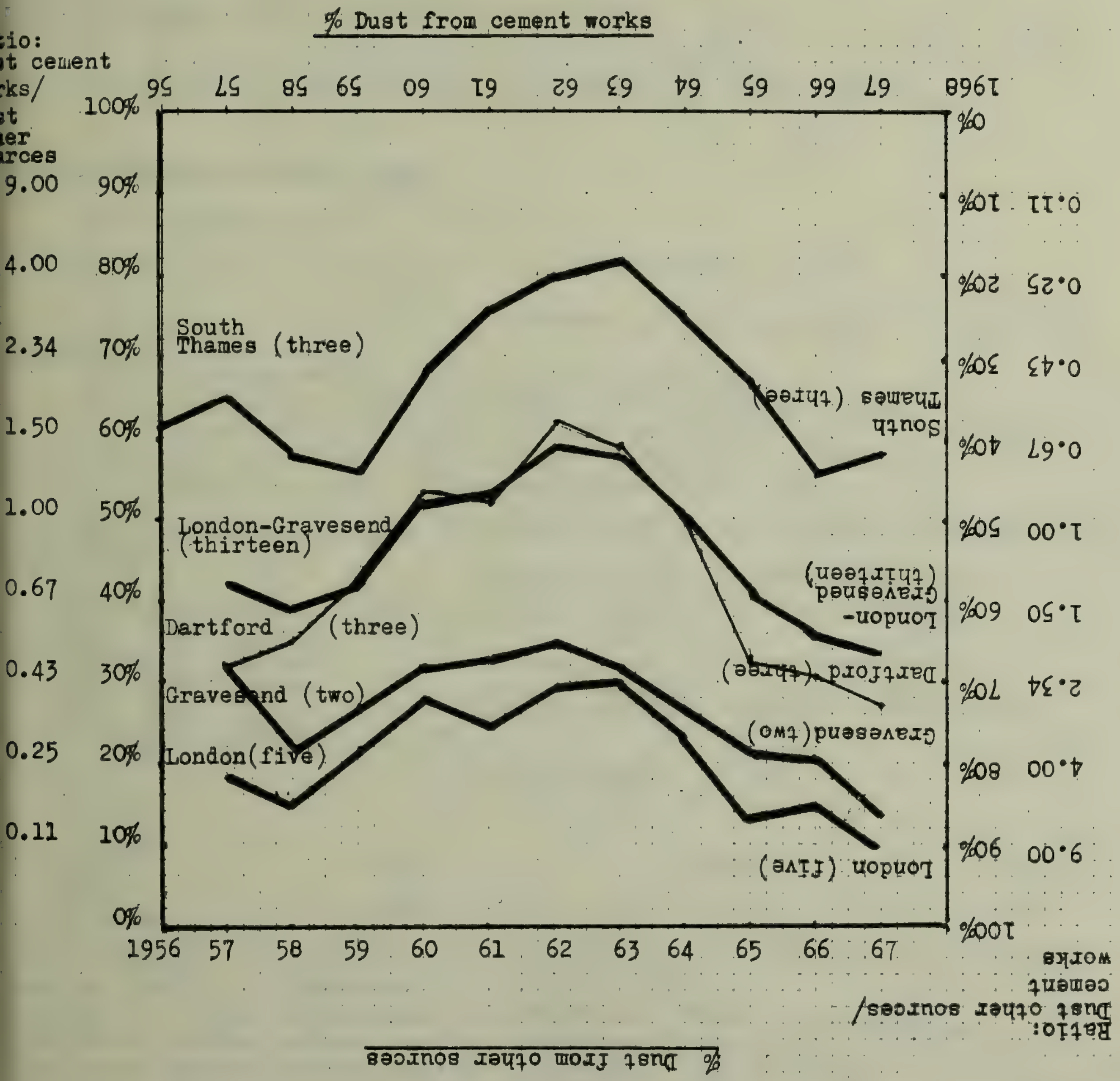
YEARLY DEPOSITS DUST TONS PER SQ.MILE Mainly 1954-69

Weighted Means of grouped gauges

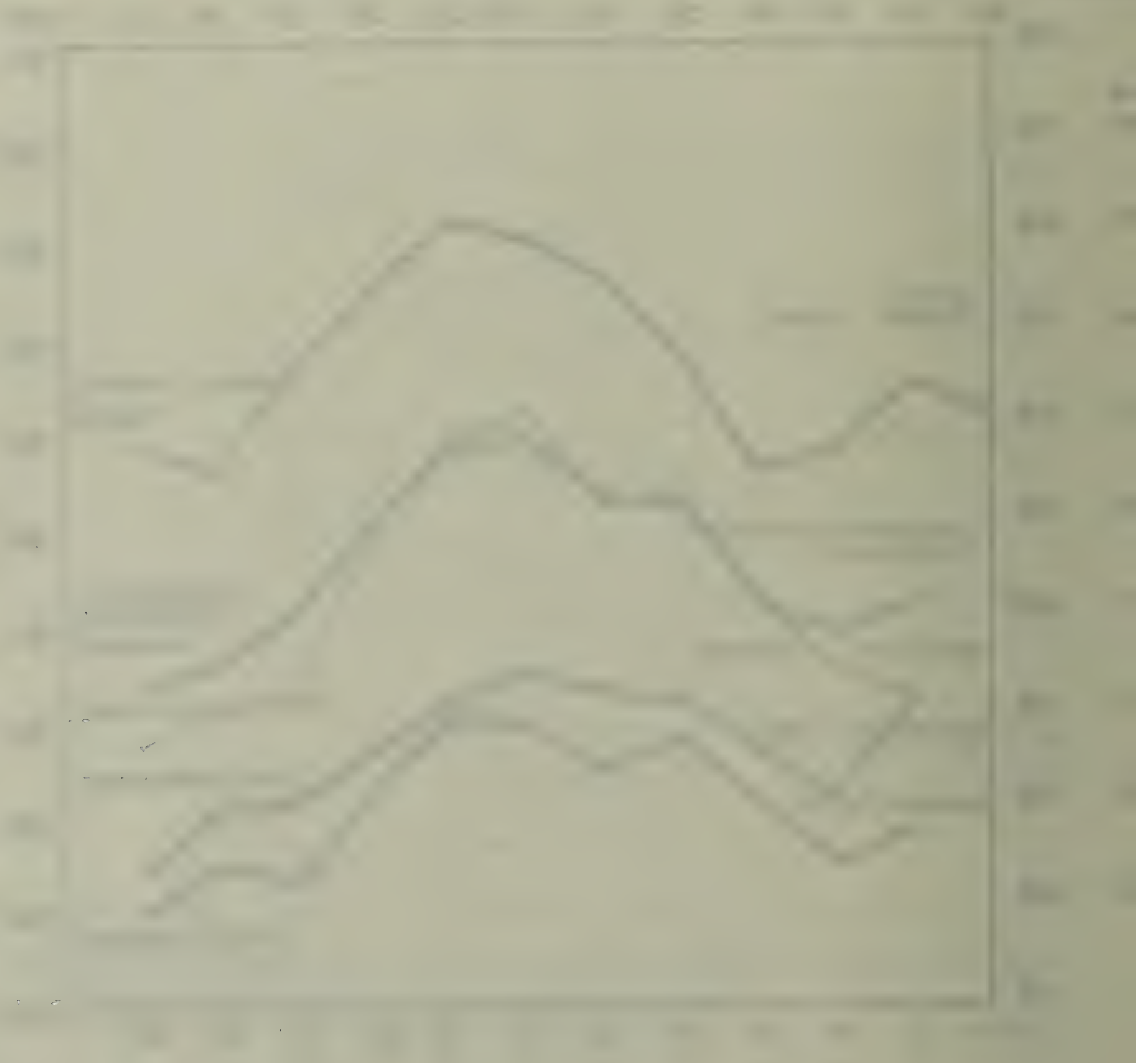




13 GAUGES - LONDON FRINGE TO GRAVESEND



13 GAUGES - LONDON FRINGE TO GRAVESEND



XXXVIII

THE SIGNIFICANCE OF CHANGES IN THE AMOUNTS OF DUST DEPOSITS STATISTICAL METHOD BY WHICH THIS HAS BEEN ESTIMATED

Let x = each individual annual deposit
n = number of annual deposits represented by mean
s.d. = standard deviation, s.e. = standard error
s.e.5, s.e.4, s.e.3 = s.e. of mean of 5,4, and 3 years observations
$s.e._a$ and $s.e._b$ be s.e's of separate means a and b.

Then:

$$s.d. = \sqrt{\frac{\text{sum } x^2 - \frac{(\text{sum } x)^2}{n}}{n-1}} \qquad s.e. = \frac{s.d.}{\sqrt{n}}$$

s.e. for periods other than the one calculated

(i) Where periods are for the same number of years the s.e. for any period is assumed as an approximation to be the same as the one calculated.

(ii) Where the periods differ in the number of years contained

$$s.e._4 = s.e._5 \sqrt{\frac{5}{4}} = s.e._5 \times 1.1. \qquad s.e_3 = s.e_5 \sqrt{\frac{5}{3}} = s.e_5 \times 1.3$$

s.e. of difference between means

$$s.e \text{ of difference} = \sqrt{s.e_a^2 + s.e_b^2}$$

If $s.e_a = s.e_b$ it follows that s.e of difference $= s.e_a \sqrt{2}$

The probability with which a difference between means might be produced by chance is obtained by:

(i) dividing the difference by s.e of difference
(ii) applying the resultant factor to the relevant line of the "t" distribution table using the 8th line for comparison of two five year periods (5-1) + (5-1) the 6th line for a comparison of a five year period with a three year period (5-1) + (3-1)

The calculations for dust from cement works in the Northfleet gauge provide an illustration.

	x	x^2
1960	434	188400
1961	332	110200
1962	343	117600
1963	361	130300
1964	300	90000
	1770	636500

$$s.d = \sqrt{\frac{636500 - \frac{1770^2}{5}}{5-1}} = \sqrt{\frac{636500 - \frac{3133000}{5}}{4}}$$

$$\sqrt{\frac{636500 - 626600}{4}} = \sqrt{\frac{9900}{4}} = \sqrt{2475} = 49.75$$

$$s.e_5 = \frac{49.75}{\sqrt{5}} = 22.2$$

Mean of yearly deposits	1955-59	1960-64	1965-67
	280	354	228

s.e for 1960-65 5 year mean i.e. 22.2 is applicable to 1955-59 5 year mean.
s.e for 1965-67 3 year mean = 22.2 x 1.3 = 28.8
s.e for difference between means of 1955-59 and 1960-64 $= 22.2\sqrt{2} = 31.4$
s.e for difference between means of 1960-64 and 1965-67 $= \sqrt{22.2^2 + 28.8^2} = 36.4$
Difference between means of 1955-59 and 1960-64 = +74 difference ÷ s.e diff.= 74/31.4 = 2.36. Apply factor 2.36 to line 8 of "t" distribution table and probability of around .05 is given.
Difference between means of 1960-64 and 1965-67 = 126. Difference ÷ s.e difference $= \frac{126}{36.4} = 3.45$. Apply factor 3.45 to line 6 of "t" distribution table and probability of around .01 is given.

TOTAL DUST

Site of gauge	Period*	Mean Annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability with which chance could produce the difference
SWANLEY	1961-64 (4 yrs)	161		10.9)			
	1965-69	186	+25	9.9)	14.7	1.70	.1
SIDCUP Black Fen	1957-59 (3 yrs)	140		8.9)			
	1960-64	158	+18	6.8))	11.2	1.61	.2
	1965-69	164	-14	6.8)	9.6	1.46	.2
SIDCUP Royal Pk	1955-59	153		7.0)			
	1960-64	160	+7	7.0))	9.9	0.71	.5
	1965-69	146	-14	7.0)	9.9	1.42	.2
BEXLEY	1955-59	187		8.4)			
	1960-64	172	-15	8.4))	11.9	1.26	.2
	1965-69	178	+6	8.4)	11.9	0.50	.6
ERITH	1955-59	202		6.3)			
	1960-64	199	-3	6.3))	8.9	.34	.7
	1965-69	212	+13	6.3)	8.9	1.46	.2
CRAYFORD	1955-59	253		11.2)			
	1960-64	288	+35	11.2))	15.8	2.22	.05
	1965-69	223	-65	11.2)	15.8	4.12	.01
DARTFORD Central	1955-59	305		11.7)			
	1960-64	288	-17	11.7))	16.5	1.03	.3
	1965-69	259	-29	11.7)	16.5	1.76	.1
DARTFORD Bow Arrow	1955-59	340		18.9)			
	1960-64	405	+65	18.9))	25.9	2.52	.05
	1965-69	369	-36	18.9)	25.9	1.39	.2
DARTFORD Joyce Green	1957-59 (3 yrs)	375		21.0)			
	1960-64	337	-38	16.1))	26.5	1.43	.2
	1965-69	302	-35	16.1)	22.8	1.54	.2
HORNS CROSS	1955-59	620		27.2)			
	1960-64	653	+33	27.2))	38.4	0.86	.4
	1965-69	628	-25	27.2)	38.4	0.65	.5
SWANSCOMBE	1955-59	564		10.0)			
	1960-64	506	-58	10.0))	14.2	4.08	.01
	1965-69	483	+23	10.0)	14.2	1.64	.2
NORTHFLEET	1955-59	507		43.7)			
	1960-64	484	-23	43.7))	61.9	0.37	.7
	1965-69	423	+61	56.9)	71.8	0.85	.4
THURROCK Ward Ave.	1955-59	357		9.8)			
	1960-64	318	-39	9.8))	13.9	2.80	.02
	1965-69	349	+31	9.8)	13.9	2.23	.05
GRAVESEND Dashwood	1957-59 (3 yrs)	230		22.4)			
	1960-64	197	-33	17.2))	28.2	1.17	.3
	1965-59	223	+26	17.2)	24.4	1.06	.3
GRAVESEND Swimming Pool	1957-59 (3 yrs)	224		4.6)			
	1960-64	215	-9	3.6))	5.8	1.60	.2
	1965-69	212	-3	3.6)	5.1	0.58	.6

LXXXIX

TOTAL DUST (continued)

Site of gauge	Period*	Mean Annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability with which chance could produce the difference
CLIFFE	1957-59 (3yrs)	292		7.3)			
	1960-64	363	+71	5.6))	9.2	7.74	.001
	1965-69	355	- 8	5.6)	7.9	1.14	.3
STROOD CEMETERY	1957-59(3 yrs)	219		12.7)			
	1960-64	218	- 1	9.8))	16.0	0.06	.9
	1965-69	220	+ 2	9.8)	13.9	0.14	.9
FORT PITT	1957-59(3 yrs)	199		9.5)			
	1960-64	189	-10	7.3))	12.0	0.83	.4
	1965-69	185	- 4	7.3)	10.5	0.39	.7
FRINDSBURY	1957-59(3 yrs)	220		24.1)			
	1960-64	214	- 6	18.8))	30.6	0.20	.8
	1965-69	240	+26	18.8)	26.6	0.98	.4
N.HALLING	1957-59 (3 yrs)	413		42.3)			
	1960-64	547	+34	32.5))	16.9	2.0	.1
	1965-69	480	-67	32.5)	46.0	1.5	.2

XC

DUST FROM CEMENT WORKS

Site of gauge	Period*	Mean Annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability with which chance could produce the difference
SWANLEY	1961-64 (4 yrs)	39		6.7)			
	1964-65	25	-14	6.0)	9.0	1.56	.2
SIDCUP Black Fen	1957-59 (3 yrs)	23		5.6)			
	1960-64	36	+13	4.3))	7.1	1.86	.1
	1965-69	15	-21	4.3)	6.1	3.45	.01
SIDCUP Royal Pk	1955-59	27		6.2)			
	1960-64	43	+16	6.2))	8.8	1.84	.1
	1965-69	24	-19	6.2)	8.8	2.16	.05
BEXLEY	1955-59	28		4.0)			
	1960-64	42	+14	4.0))	5.7	2.46	.05
	1965-69	28	-18	4.0)	5.7	3.16	.02
ERITH	1955-59	38		3.4)			
	1960-64	46	+ 8	3.4))	4.8	1.67	.1
	1965-69	27	-19	3.4)	4.8	3.96	.01
CRAYFORD	1955-59	51		18.4)			
	1960-64	99	+48	18.4))	26.0	1.84	.1
	1965-69	48	-51	18.4)	26.0	1.96	.1
DARTFORD Central	1955-59	94		10.3)			
	1960-64	146	+52	10.3))	14.6	3.56	.01
	1965-59	86	-60	10.3)	14.6	4.11	.01
DARTFORD Bow Arrow	1955-59	148		16.9)			
	1960-64	267	+119	16.9))	24.0	4.96	.001
	1965-69	143	-124	16.9)	24.0	5.18	.001
DARTFORD Joyce Green	1957-59 (3 yrs)	118		9.7)			
	1960-64	155	+37	7.5))	12.3	3.01	.02
	1965-69	80	-75	7.5)	12.3	6.10	.001

XC

DUST FROM CEMENT WORKS (continued)

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability with which chance could produce the difference
HORNS CROSS	1955-59	413		24.5)			
	1960-64	517	+ 104	24.5))	34.5	3.02	.02
	1965-69	401	- 116	24.5)	34.5	3.36	.01
SWANSCOMBE	1955-59	322		8.7)			
	1960-64	379	+ 57	8.7))	12.3	4.62	.01
	1965-69	295	- 84	8.7)	12.3	6.80	.001
NORHTFLEET	1955-59	280		22.2)			
	1960-64	354	+ 74	22.2))	31.4	2.36	.05
	1965-67 (3 yrs)	228	- 126	28.8)	36.4	3.45	.01
THURROCK Ward Ave.	1955-59	165		11.8)			
	1960-64	202	+ 37	11.8))	16.7	2.21	.05
	1965-69	179	- 23	11.8)	16.7	1.38	.2
GRAVESEND Dashwood	1957-59 (3 yrs)	59		1.7)			
	1960-64	66	+ 7	1.3))	2.14	3.27	.02
	1965-69	38	- 28	1.3)	1.84	15.4	.001
GRAVESEND Swimming Pool	1957-59 (3 yrs)	61		5.5)			
	1960-64	65	+ 4	4.2))	6.86	5.82	.001
	1965-69	37	- 28	4.2)	6.0	4.70	.001
CLIFFE	1957-59 (3 yrs)	122		65.5)			
	1960-64	191	+ 69	50.5))	82.7	.83	.4
	1965-69	191	--	50.5)	71.5	0.00	1.0
STROOD CEMETERY	1957-59 (3 yrs)	95		13.1)			
	1960-64	116	+ 21	10.1))	16.5	1.27	.3
	1965-69	105	- 11	10.1)	14.3	.77	.5
FOR PITT	1957-59 (3 yrs)	73		6.1)			
	1960-64	77	+ 4	4.7))	7.70	.52	.6
	1965-69	56	- 21	4.7)	6.65	3.15	.02
FRINDSBURY	1957-59 (3 yrs)	76		22.1)			
	1960-64	92	+ 16	17.0))	27.9	.57	.6
	1965-69	108	+ 16	17.0)	24.1	.66	.5
N.HALLING	1957-59 (3 yrs)	292		31.8)			
	1960-64	425	+ 133	24.5))	40.1	3.31	.02
	1965-69	295	-130	24.5)	33.6	3.87	.01

XCI

DUST FROM OTHER SOURCES

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability with which chance could produce the difference
SWANLEY	1961-64 (4 yrs)	122		12.5)			
	1965-59	161	+ 39	11.3))	16.9	2.3	.05
SIDCUP Black Fen	1957-59 (3 yrs)	116		7.4)			
	1960-64	121	+ 5	5.7))	9.3	0.54	.06
	1965-69	148	+ 27	5.7)	8.1	3.33	.02

XCI

DUST FROM OTHER SOURCES (continued)

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff ÷ by S.E. of diff.	Probability with which chance could produce the difference
SIDCUP Royal Pk	1955-59	125		6.8)			
	1960-64	117	- 8	6.8))	9.6	0.83	.4
	1965-69	121	+ 4	6.8)	9.6	0.42	.7
BEXLEY	1955-59	158		5.2)			
	1960-64	129	- 29	5.2))	7.4	3.94	.01
	1965-69	150	+ 21	5.2)	7.4	2.85	.05
ERITH	1955-59	164		7.3)			
	1960-64	153	- 11	7.3))	10.4	1.05	.3
	1965-69	184	+ 31	7.3)	10.4	2.97	.05
CRAYFORD	1955-59	201		5.6)			
	1960-64	189	- 12	5.6))	7.9	1.52	.2
	1965-69	176	- 13	5.6)	7.9	1.64	.2
DARTFORD Central	1955-59	210		3.7)			
	1960-64	142	- 68	3.7))	5.3	12.95	.001
	1965-69	173	+ 31	3.7)	5.3	5.90	.001
DARTFORD Bow Arrow	1955-59	192		15.5)			
	1960-64	138	- 54	15.5))	22.0	2.46	.05
	1965-69	225	+ 87	15.5)	22.0	3.96	.01
DARTFORD Joyce Green	1957-59 (3 yrs)	257		21.5)			
	1960-64	182	- 75	16.5))	27.1	2.78	.05
	1965-69	219	+ 37	16.5)	23.4	1.58	.2
HORNS CROSS	1955-59	207		26.8)			
	1960-64	136	- 71	26.8))	37.8	1.88	.1
	1965-69	227	+ 91	26.8)	37.8	2.41	.05
SWANSCOMBE	1955-59	241		8.0)			
	1960-64	126	-115	8.0))	11.3	10.2	.001
	1965-69	188	+ 62	8.0)	11.3	5.3	.001
NORTHFLEET	1955-59	226		25.4)			
	1960-64	130	- 96	25.4))	35.9	2.68	.05
	1965-67 (3 yrs)	195	+ 65	25.4)	41.7	1.56	.2
THURROCK Ward Ave.	1955-59	182		12.0)			
	1960-64	116	- 66	12.0))	17.0	3.8	.01
	1965-69	170	+ 54	12.0)	17.0	3.2	.02
GRAVESEND Dashwood	1957-59 (3 yrs)	171		24.3)			
	1960-64	130		18.7))	30.7	1.3	.2
	1965-69	184	+ 54	18.7)	26.5	2.0	.1
GRAVESEND Swimming Pool	1957-59 (3 yrs)	163		7.6)			
	1960-64	150	- 13	6.0))	9.8	1.3	.2
	1965-69	175	+ 25	6.0)	8.5	2.9	.05
CLIFFE	1957-59 (3 yrs)	169		13.9)			
	1960-64	148	- 21	10.7))	17.5	1.2	.3
	1965-69	163	+ 15	10.7)	13.9	1.1	.3

DUST FROM OTHER SOURCES (continued)

Site of gauge	Period*	Mean annual deposit	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability with which chance could produce the difference
STROOD CEMETERY	1957-59 (3 yrs)	124		5.9)			
	1960-64	102	- 22	4.5))	7.3	3.0	.02
	1965-69	125	+ 23	4.5)	6.4	3.6	.02
FORT PITT	1957-59 (3 yrs)	122		13.5)			
	1960-64	111	- 11	10.4))	17.0	0.7	.5
	1965-69	129	+ 18	10.4)	14.7	1.2	.3
FRINDSBURY	1957-59 (3 yrs)	144		5.3)			
	1960-64	122	- 22	4.1))	6.7	3.3	.02
	1965-69	131	+ 9	4.1)	5.3	1.7	.2
N.HALLING	1957-59 (3 yrs)	120		15.4)			
	1960-64	122	+ 2	11.9))	19.6	0.1	.9
	1965-69	185	+ 65	11.9)	16.8	3.8	.01

XCII

SUMMATED READINGS OF GROUPS OF GAUGES

Sites of gauges in group	Period	Mean annual summated reading	Diff. from prev. period	S.E. based on last 5 year period	S.E. of diff.	Diff. ÷ by S.E. of diff.	Probability for chance to produce difference
			TOTAL DUST				
SIDCUP(2)	1957-59(3 yrs)	922		36.6			
BEXLEY,ERITH	1960-64	975	+ 53	28.3	46.3	1.15	.3
CRAYFORD	1965-69	923	- 52	28.3	40.0	1.30	.2
DARTFORD Ce	1957-59(3 yrs)	1006		52.0			
DARTFORD B.A	1960-64	1031	+ 25	44.0	68.1	0.36	.7
DARTFORD J.C	1965-69	931	-100	44.0	62.2	1.61	.2
HORNS CROSS	1955-59	1690		82.0			
SWANCOMBE	1960-64	1643	- 47	82.0	115.8	0.41	.7
NORTHFLEET	1965-67 (3 yrs)	1191	-452	106.6	134.5	3.37	.02
GRAVESEND	1957-59(3 yrs)	455		23.3			
Dashwood &	1960-64	412	- 43	17.9	29.4	1.47	.2
S.Pool	1965-69	435	+ 23	17.9	25.3	0.91	.4
STROOD CEM	1957-59(3 yrs)	639		66.3			
FORT PITT	1960-64	622	- 17	51.0	83.7	0.20	.8
FRINDSBURY	1965-69	725	+103	51.0	72.0	1.43	.2
			DUST FROM CEMENT WORKS				
SIDCUP (2)	1957-59(3 yrs)	171		36.8			
BEXLEY,ERITH	1960-64	268	+ 97	28.3	46.4	2.10	.1
CRAYFORD	1965-69	143	-125	28.3	40.1	3.12	.01
DARTFORD Ce	1957-59(3 yrs)	365		41.2			
DARTFORD B.A	1960-64	568	+203	31.7	51.9	3.92	.01
DARTFORD J.C	1965-69	311	-257	31.7	45.0	5.72	.001
HORNS CROSS	1955-59	1016		48.4			
SWANSCOMBE	1960-64	1250	+234	48.4	68.4	3.43	.01
NORTHFLEET	1965-67	922	-328	62.3	78.9	4.17	.01
GRAVESEND	1957-59(3 yrs)	120		6.85			
Dashwood &	1960-64	131	+ 11	5.26	8.64	1.28	.3
S.Pool	1965-69	75	- 56	5.26	7.45	7.52	.001
FRINDSBURY	1957-59(3 yrs)	248		39.4			
STROOD	1960-64	287	+ 39	30.3	49.7	0.79	.5
FORT PITT	1965-69	270	- 17	30.3	44.7	0.38	.7
			DUST FROM SOURCES OTHER THAN CEMENT WORKS				
SIDCUP (2)	1957-59(3 yrs)	750		20.5			
BEXLEY,ERITH	1960-64	710	- 40	15.8	25.9	1.55	.2
CRAYFORD	1965-69	779	+ 69	15.8	22.3	3.09	.02
DARTFORD CEN	1957-59(3 yrs)	641		40.6			
DARTFORD B.A	1960-64	463	-178	31.3	51.3	3.47	.01
DARTFORD J.C	1965-69	620	+157	31.3	44.1	3.55	.01
HORNS CROSS	1955-59	674		58.2			
SWANSCOMBE	1960-64	392	-282	58.2	82.3	3.43	.01
NORTHFLEET	1965-67(3 yrs)	602	+210	75.7	95.5	2.20	.05
GRAVESEND	1957-59(3 yrs)	334		26.4			
Dashwood &	1960-64	280	- 54	20.3	33.3	1.64	.2
S.Pool	1965-69	360	+ 80	20.3	28.8	2.79	.02
STROOD CEM	1957-59(3yrs)	391		18.6			
FORT PITT	1960-64	335	- 56	14.4	23.6	2.38	.05
FRINDSBURY	1965-69	375	+ 40	14.4	20.3	1.97	.1